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ABSTRACT

A comparative evaluation methodology for vocational-technical education programs offered at public community colleges in Texas is described in this study. Evaluation concepts, design and methodology for comparative evaluation, trial of the comparative rating scale model, and feedback loop with recommendations for revision are presented. The comparative rating scale model was developed to provide a comparative rating of similar programs at different community coleges, giving each individual rating in the form of a single rating score. Steps in the development and use of this score are described in detail. As a result of the study it was recommended that the program evaluation section of the Texas State Plan for Vocational Education be thoroughly revised and more precisely delineated through development of a systematic methodology and review of data collection formats. (MF)

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THE COMPARATIVE RATING SCALE MODEL:
OCCUPATIONAL PROGRAM EVALUATION IN HIGHER EDUCATION

by

CHARLES D. RORIE, Ph.D.

Published by

The Office of School Surveys and Studies
Department of Educational Administration
The University of Texas at Austin

in cooperation with

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Department of Occupational Education and Technology
Texas Education Agency

1973

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A C K N O W L E D G M E N T S

Appreciation is expressed to Dr. John E. Roueche for serving as chairman of my committee. Gratitude is also extended to Drs. Michael Thomas, Carl Ashbaugh, John King, and Geneva Gay for serving as committee members.

To Dr. L. D. Haskew and the other members of the faculty of the Department of Educational Administration, I am grateful for their aid and guidance during the two-year program in community college administration. Their knowledge and experience provided both insight and breadth to the study of the community junior college.

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To my wife, Judy, I owe a special debt of gratitude for her love, patience, and understanding throughout this endeavor. Not the least of her many contributions was her phenomenal ability to see all my work as excellence. She taught me to strive to match her perception of me. I hope that this dedication may serve to give public recognition to her great talents as a wife and mother, as well as to her fantastic capacity for enjoying life

while giving joy to those around her. I would like to confer my own degree on her as a "Doctor of Domestic Science." Her constant support and confidence in my ability provided the essential working atmosphere of success which led to the acquisition of this Doctor of Philosophy degree.

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C. D. R.

The University of Texas at Austin
August 1973

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C H A P T E R I

INTRODUCTION

As the costs of public education have continued to increase, accountability has become a major subject of educational discussion and a focus of sharp controversies. Ten years ago, the word rarely appeared in educational publications and was not mentioned on the programs of educational organizations (60:1). But now, increased demands on public revenue have led to a national trend: the public wants evidence that its money is being spent wisely (24:1).

This has been brought about through several recent developments. An increasing portion of the average family's income is now spent on taxes. A considerable number of today's youth are failing to meet even the minimum standards of literacy now demanded for employment in civilian or military jobs. Also, industry and defense have developed management procedures that demand increased "effectiveness and efficiency of certain production organizations" (60:1).

"Accountability is ~~both fundamental~~ and complex: it can be applied to the activities of an individual, a department, a division, or an institution. Accountability accents results, and educational accountability focuses on results with concern for a reasonable cost" (102:1-23).

Responding to these increasingly determined taxpayers' efforts to judge the quality of education being bought by their dollars, educators are gradually placing higher priorities on evaluations of their programs. But, how are they to make such assessments? What should they assess? As the public demands evaluation, and as more and more federal and state laws require program evaluations, how will educational administrators meet this need? The educator trying to make such an assessment today is becoming tired "of being criticized by his supporters and his publics because he cannot provide evidence that what he has chosen to do is reasonable and workable . . . . Or because he did not ask the 'right' questions, measure the 'right' variables, or use the 'right' instruments" (123:4).

What is evaluation? The term is used with a great variety of intended meanings. Probably the most positive and useful definition of evaluation is that suggested by the well known Phi Delta Kappa Study. "Educational

evaluation is the process of delineating, obtaining, and providing useful information for judging decision alternatives" (123:40). With this theoretical base, it becomes clear that "the purpose of evaluation is not to prove but to improve" (123:v).

Such improvement in state educational programs may become legally mandatory. The level of public support for postsecondary education reflects a new awareness that resources are not unlimited. State administrators are faced with the real possibility that future funding patterns may require decisions to eliminate some inefficient and ineffective duplications in state program offerings.

With this possible emerging decision need in mind, the legal evaluation requirements already existing have taken on new meaning for administrators, particularly at the state level.

As an administrative intern with the Post-Secondary Division of the Department of Occupational Education and Technology, at the Texas Education Agency, the author became involved in one of the first attempts to develop state-level program evaluation plans for the post-secondary vocational/technical training programs of Texas.

Background of the Study

There are few proposed evaluation plans for vocational and technical education. Two major efforts have emerged in this field: Instruments and Procedures for the Evaluation of Vocational/Technical Education Institutions and Programs, published in "Pilot Test Edition" by the American Vocational Association, in December, 1971; and A System for State Evaluation of Vocational Education, developed by the Center for Vocational and Technical Education at the Ohio State University, in January, 1972.

The American Vocational Association's Instruments and Procedures is directed toward the traditional process-evaluation approach, including many of the features well known and common in the evaluation processes of regional accrediting agencies. In fact, the "Preface" clearly states that "accreditation of vocational/technical education" is the main purpose of the volume (10:3). Assessment of program effectiveness is left largely to the individual schools in this methodology.

A System for State Evaluation uses program objectives and goal statements as a basis for assessing the extent of program achievements. It provides for the use of "written performance objectives based on an analysis of

required occupational competencies" (22:7). However, neither the Ohio Center nor the American Vocational Association offers any guide for assessment based on data available to state agencies.

Other attempts include Tomlinson's study (145: abstract) to analyze differential program costs of selected occupational curricula in a sampling of junior colleges. He found that to "be effective, a cost accounting system must be developed . . . ." He also specified that the most significant variable affecting the cost per student-hour, the course cost, and the program cost, was the size of enrollment in individual classes. Tomlinson's study stressed the need of the state division of vocational and technical education for accurate cost data. An accurate program cost identification system was deemed essential.

Program efficiency was also discussed by Roueche when he suggested that possible alternative programs may be "evaluated by means of a preliminary process known as costing." He further suggested that base line data necessary for accountability should include the "success ratio of students by current program . . . ." Thus Roueche used "per-student-cost" as one data element for evaluation (102: 31-36).

Forgey's study notes that "programs should be re-evaluated on the basis of effectiveness in assisting individuals in their goal achievement." And, he adds that junior colleges should have on-going follow-up and evaluation programs in all occupational education areas. The importance of good cost-accounting procedures was also stressed as necessary for meaningful analysis of comparable data among colleges (35:abstract).

Vocational and Technical education in Texas post-secondary institutions has experienced steady increases in enrollments, numbers of programs offered, and number of different kinds of programs available (130:1). This growth has occurred at such a rapid pace that the state agency charged with the supervision and direction of this aspect of Texas higher education has been called upon to direct its main efforts toward the planning of new programs, in consultation with community colleges, and other local educational institutions (41:1-4).

The Post-Secondary Division of the Department of Occupational Education and Technology of the Texas Education Agency does provide a variety of additional services (41:4-11). However, only minimal work has been attempted toward the development of any on-going program evaluation,

other than content and process observation, with subjective reporting by Agency Consultants (65:1).

Aware of the need for evaluation of programs, Director Joseph D. Godsey, head of the Post-Secondary Division, initiated the first action through one of his consultants, Dr. John R. Martin, by charging him with the development of an evaluation methodology for determining the effectiveness of occupational curricula. Dr. Martin began examination of the problem immediately and made his first report of findings in a memorandum in late November, 1971 (67:1). This resulted in a meeting of the Executive Committee of the Deans and Directors Association, made up of the leaders in supervision of vocational/technical education at the postsecondary level in Texas (66:2).

Dr. Martin compiled program statistics in an effort to find a meaningful method of assessing the effectiveness of vocational/technical programs. His data were concerned mainly with an attempted sampling of the cost-effectiveness of vocational/technical programs as measured by the rate of state dollars per program completion as reported by the institution (68:1-2). The Executive Committee considered Dr. Martin's memorandum (69:1-3), but was very reluctant to approach program evaluation in other than process-assessment terms (70:1-2).

Dr. Martin prepared three further reports for Director Godsey on this matter prior to his promotion to another division of the Texas Education Agency. These reports made further data samplings and analyses in an effort to identify indicators of effectiveness for vocational/technical programs. He concluded that "there is no single norm to which a college can be compared and fairly rate its performance. I would suggest we fix on more than one, maybe five or six norms to apply to a college and from these perhaps devise a profile of the college that would be a basis for comparison with not only an ideal profile but with other colleges" (70:2).

He prepared additional comparison charts toward this end (71:3); but in his last report, Dr. Martin indicated that his research was inadequate to support a comparative evaluation of vocational/technical programs. However, he did suggest two calculations as a "quantitative measurement of the efficiency with which Voc-Tech. programs are conducted by the community colleges . . . ." He chose "completions as a percent of enrollment, and . . . dollars per completion . . . ." These figures were suggested as a beginning point for additional research. However, such was deemed "too time consuming" within the framework of his new position (72:1-3).

A search of Agency files and records, and confirmation by discussions with Texas Education Agency personnel, showed no further steps have been taken for additional consideration of the problem of identifying one or more data elements useful to evaluation of programs. There was, however, great interest in such a project because of its potential value to the Agency (136).

Statement of the Problem

The Texas State Plan for Vocational Education, Fiscal Year 1973, requires program evaluations, in compliance with federal laws such as the Higher Education Act of 1965, the Vocational Education Act of 1963, and related Acts and subsequent amendments, including the Education Amendments of 1972. The requirement for program evaluations includes all those vocational/technical programs being offered at public community colleges in Texas. Such programs are under the supervision of the Post-Secondary Division of the Department of Occupational Education and Technology of the Texas Education Agency.

Until recently, postsecondary program evaluation had a lower priority than new program development. When it became apparent that future funding patterns might

require decisions to eliminate some inefficient and ineffective duplications in state program offerings, an urgent need was recognized for an objective, comparative evaluation methodology.

TEA identified the decision to be served by comparative evaluation of similar-type program offerings: given limited resources, which programs should be terminated? The State Plan provided the criteria to be applied in making the decision. But no agency source identified the information required for the decision, and no objective methodology existed for making such judgments.

Because of the urgency of the need, and the considerable amount of reporting already required of the colleges involved, the decision was made to utilize data either already available to TEA, or otherwise readily obtainable from other state-level sources.

The problem of this study, then, became the identification of the needed evaluative information; the process of collecting, organizing, and analyzing this information; the fitting of this information together into a system that would provide a comparative evaluation of similar-type programs; and the reporting of this information to the decision makers.

Purposes of the Study

The immediate purpose of this study was to provide a simple and objective system for the Texas Education Agency's Post-Secondary Division administrators to use in making comparative evaluations of similar-type vocational/technical education programs being offered at different public community colleges in Texas.

The domains of information identified from the criteria set by the Texas State Plan for Vocational Education were used in the selection of data element measures for the evaluation system.

However, the system designed was to be highly flexible. A further purpose of the study was to enable the agency to make objective comparative evaluations as criteria changed in the future. This was achieved through a format allowing individual data elements, and their weights within the evaluation system, to be varied at will as continuous feedback dictated revision.

Thus, in addition to providing an immediately usable evaluation method for the Texas Education Agency's current decision need, the system development had the additional purpose of giving TEA a flexible tool that would be adaptable to the different needs to be established in

the future for other kinds of decisions that may require comparative evaluation of programs.

Finally, the framework of the evaluation system was designed for the larger purpose of providing a comparative evaluation method based on sound scientific, practical, and prudential criteria, that may be useful, in a more general sense, as an aid to educational decision makers.

Definitions of Terms

For the purposes of this study the following terms are defined according to their intended meaning in this investigation:

Texas public community college. This term was operationally defined as referring to those state-supported junior or community colleges located in Texas which received funding through the Texas Education Agency for at least one two-year vocational/technical education program in existence in September, 1969, with a first-year enrollment of at least 30 students.

Other such institutions. This term was operationally defined in the same manner as "Texas public community college."

Given-type program. This term was operationally defined as a two-year vocational/technical education program, with a first-year class of at least 30 students in September of 1969, funded by the Texas Education Agency, Post Secondary Division, and reported to them under the United States Office of Education's Instructional Code designation system.

Similar-type program. This term was operationally defined in the same manner as "given-type program" described earlier.

Enrollments. This term was operationalized through the gathering of data from Texas public community colleges, program by program, to establish the actual number of students originally enrolling in each given-type program at the start of the 1969-70 academic year.

Follow-up data. This term was operationalized through the gathering of data from Texas public community colleges, program by program, to establish the program results of each given-type program at the end of the 1970-71 academic year.

Costs to the state. This term was operationalized as the total state contact-hour-formula funding earned by each given-type program in each Texas public

community college, during the 1970-71 academic year. These data were collected from official records, both state and local, as required.

In order to provide uniform methodology for comparative evaluation of given-type programs at given Texas public community colleges, all data concerning programs were collected from the academic year 1970-71. It was assumed that this data reflected each program's class of first-year students who began a two-year program at the beginning of the 1969-70 academic year.

The study additionally assumed that the total state contact-hour-formula funding earned by each individual two-year vocational/technical education program in each Texas public community college provided uniformity in methodology of costing. Since contact-hours-funding earned by each individual two-year program for the 1970-71 academic year included both the funding for the sample to be analyzed (1969-70 first-year students of two-year programs) plus similar funding for a new class of first-year students (1970-71 first-year students), the study assumed that these combined figures represent the total state costs for both years of training of the class commencing training at the beginning of the 1969-70 academic year.

In order to insure the practicability of the evaluation format developed, only data sources available to the Texas Education Agency at the time of the study (including data available to TEA from the Coordinating Board, Texas College and University System) were utilized.

Description of the Variables

From the State Plan criteria established for the evaluation of vocational/technical education programs in Texas, five domains of decision-information were identified by this study: (a) need for the given program in the given local area; (b) the response of the local area to the offering of the program; (c) costs of the program; (d) the results of the operation of the program; and (e) the documentation of the program.

After an inventory of the data already available to the Texas Education Agency, and a search through the pertinent data readily obtainable from other state-level sources, several measures were selected for each domain of information identified. These measures were then submitted to the Panel of Decision Makers, designated from the administration of the Post-Secondary Division of the Texas

Education Agency, for assignment of weights to be used in the comparative evaluation of programs.

For the trial run of the Comparative Rating Scale Model developed for this study (and detailed in Chapter III), the Panel's assigned weights were used for the following selected measures:

(a) Need

(1) Current Employment in Field in local area, as measured by the report of the local education agency's Annual Application for Funds for Post Secondary Occupational Programs, Fiscal Year 1971.

(2) Projected Demand in Field locally, as measured by the report of the local education agency's Annual Application for Funds for Post Secondary Occupational Programs, Fiscal Year 1971.

(3) Projected Supply in Field from Public Education locally, as measured by the local education agency's Annual Application for Funds for Post Secondary Occupational Programs, Fiscal Year 1971.

(4) Projected Supply in Field from Nonpublic Education locally, as measured by the report of

the local education agency's Annual Application for Funds for Post Secondary Occupational Programs, Fiscal Year 1971.

(b) Response

(1) First-Year-Student Enrollment for 1969-70 Academic Year, as measured by survey of the Texas Guidance Information Program.

(2) Combination of First and Second Year Student Enrollment during academic year of 1970-71, as measured by report of local education agency to TEA for USOE enrollment report.

(c) Costs

(1) Program's Contact-Hour Dollars Earned for 1970-71 as measured by the TEA report: Student Contact Hours Taught in Texas Public Junior Colleges, April, 1971.

(2) Estimated Local Funds for Program's Budget for 1970-71, as measured by the local education agency's Annual Application for Funds for Post Secondary Occupational Programs, Fiscal Year 1971.

(d) Results

(1) Program Completions for Fiscal Year 1971, as

measured by the local education agency's report to TEA of "Placement of Program Completions in Vocational Education Programs" 1970-71 USOE Report.

(2) Students leaving prior to completion with marketable skill, as measured by the report of the local education agency to TEA of "Placement of Program Completions in Vocational Education Programs" for 1970-71 USOE Report.

(3) Students known to be employed full-time in field trained or related field, as measured by the local education agency's report to TEA of "Placement of Program Completions in Vocational Education Programs" for 1970-71 USOE Report.

(4) Students known to be unemployed, as measured by the report of the local education agency to TEA of "Placement of Program Completions in Vocational Education Programs" for 1970-71 USOE Report.

(e) Documentation: Submission of

(1) Annual Application for FY 1971

(2) USOE Enrollment Report for FY 1971

(3) USOE Follow-Up Report for FY 1971

(4) Texas Guidance Information Program participation (1970)

Organization of the Remainder of the Study

Chapter I has presented the problem, purposes of the study, and brief descriptions of the variables and measures by which the Comparative Rating Scale Model developed evaluations of similar-type vocational/technical education programs at different public community colleges in Texas.

Chapter II will give a review of related evaluation concepts, from the literature, particularly as applicable to comparative program evaluations.

Chapter III will be concerned with research design and methodology, showing the evaluation plan of the study, and the trial Comparative Rating Scale Model developed, with the questionnaire elements presented to the Panel of Decision Makers.

Chapter IV will be the presentation and analysis of the data collected, including the comparative program ratings developed.

Chapter V will show the Feedback Loop and recommendations for revision of the model, as feedback to the Panel of Decision Makers.

C H A P T E R I I

RELATED EVALUATION CONCEPTS

Introduction

> Man is apparently so constituted that he cannot refrain from evaluating, judging, appraising, or valuing almost everything that comes within his purview. Much of this evaluating is highly egocentric in that the individual judges things as they relate to himself. . . . Although utility is an important criterion for the individual's evaluations, familiarity, lack of threat to self; status considerations, and ease of comprehension may also form criteria for judgements which are no less egocentric than utility. (12:186)

Education is not exempt from this natural drive for appraisal and evaluation. There is no reason that it should be exempt. In fact, there are compelling reasons why the field of education should be assessed continually. The size of the investment of resources alone would be sufficient rationale for educational evaluation.

Yet there is widespread resistance to evaluation in education. Evaluation continues to be considered as a threat rather than an aid. Educators fail to perceive what formal evaluation could do for them (116:523). The positive values are ignored because fears of judgment from superiors in the educational hierarchy.

Evaluation applied to education implies a general agreement that the goal of education is excellence. However, it seems that there will always be a debate about how schools and students should excel. There is little knowledge anywhere today of the quality of a student's education (116:535).

Educators differ among themselves as to both the essence and worth of an educational program. The wide range of evaluation purposes and methods allows each to keep his own perspective. Few see their own programs "in the round," partly because of a parochial approach to evaluation. "To understand better his own teaching and to contribute more to the science of teaching, each educator should examine the full countenance of evaluation " (116:523).

The lack of any real agreement about the meaning of the very term evaluation causes much of the confusion, uncoordinated efforts, and fears surrounding the issue. So many different meanings have been given to evaluation that the resulting lack of understanding is natural. A sound conceptual base is required for productive efforts in this important area.

A Definition of Evaluation

A major failing of evaluation today has been the lack of an adequate definition. Previously, evaluation was equated with (a) measurement and testing, (b) statements of congruence between performance and objectives, or (c) professional judgments. Program evaluation involves activities and information of a broader scope than is inherent in any one of these definitions. Evaluation should identify decision options, explicate values and criteria, and provide information that assists decision makers in judging the options (1:2).

The Stufflebeam definition of evaluation (Phi Delta Kappa National Study Committee on Evaluation) was selected as the basis for planning this study. With the educational establishment in a constant state of change, choice from among alternatives becomes a crucial element in improvement. Choice implies a decision. The task of evaluation then becomes one of providing information to the decision makers so that they may devise strategies other than blind reaction for responses to their decision needs (123:37-38).

"Evaluation is the process of delineating, obtaining, and providing useful information for judging

decision alternatives" (123:xxv). This definition centers on the decision-making rationale as a basis for evaluation. Figure 1 (shown on the following page) represents this view schematically.

Stufflebeam's definition is deceptively simple. Evaluation is a particular and continuing activity subsuming many methods and involving many activities (123:40). Program evaluation must be concerned with responding to a wide variety of information needs of educational administrators under actual, diverse, often uncontrollable, conditions (1:4). The provision of information to decision makers is central.

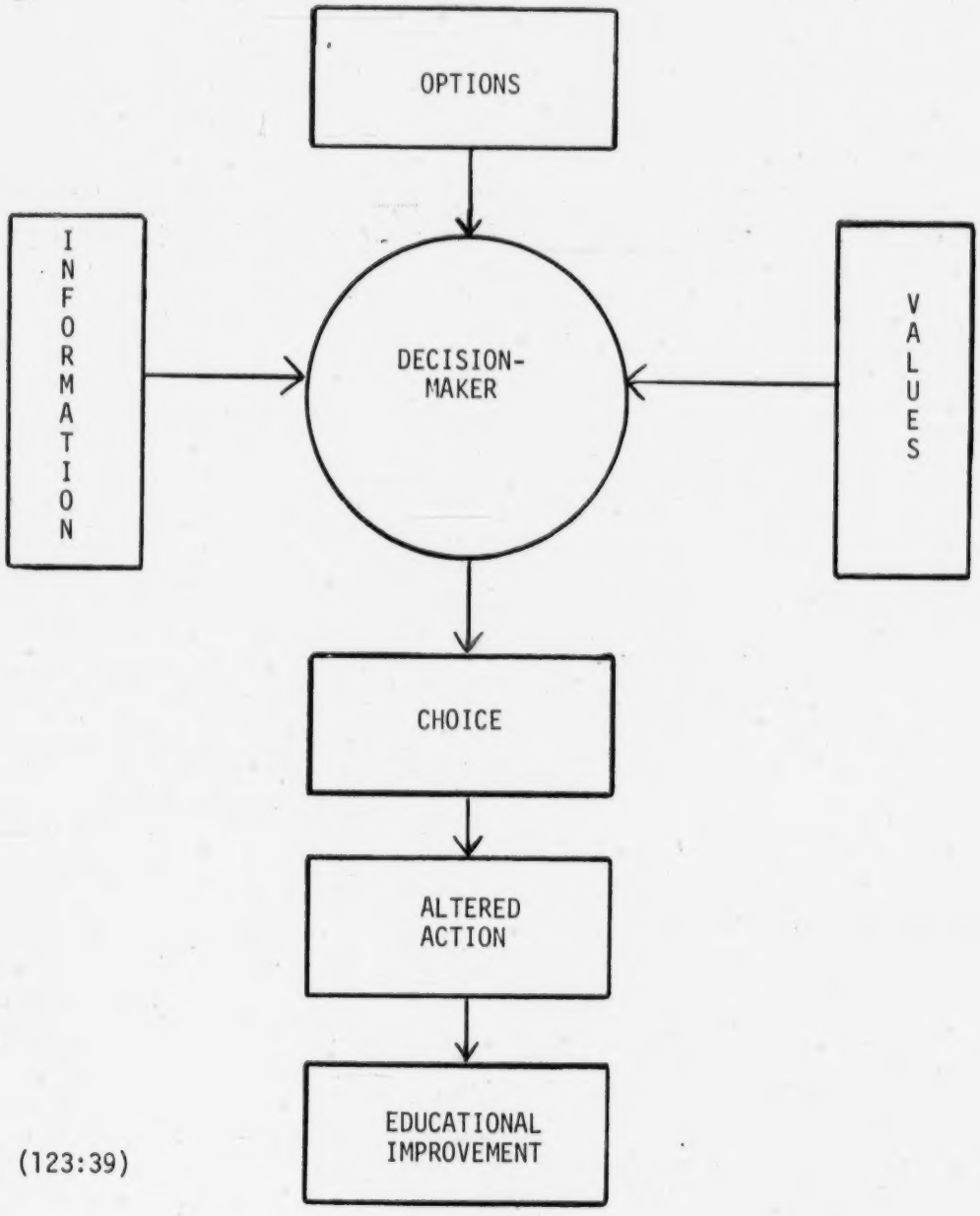
It is possible to derive a systematic methodology from Stufflebeam's definition of evaluation. Such a methodology can be applied to educational programs to produce a comparative rating. Such a comparative rating may be particularly practical in areas where absolute standards have not been developed.

Comparative Program Evaluation

Today, educators fail to perceive what formal evaluation could do for them. They should be imploring measurement specialists to develop a methodology that

FIGURE 1

A SCHEMATIC OF THE DECISION-MAKING RATIONALE
AS A BASIS FOR EVALUATION



(123:39)

reflects the fullness, the complexity, and the importance of the programs. They are not (116:524).

School officials cannot yet revise a curriculum on rational grounds, and the needed evaluation is not under way. Scriven indicates that what the educator wants to know is whether or not one program is better than another, and that the best way to answer this question is by direct comparison. An educator faced with a decision on adoption, or elimination, of a program is most likely to be satisfied by this approach (107:39-89).

Stake says that "There is no clear picture of what any school or any curriculum project is accomplishing today partly because the methodology of processing judgments is inadequate. What little formal evaluation there is is attentive to too few criteria, overly tolerant of implicit standards, and ignores the advantage of relative comparisons" (107:536).

Two conceptual frames are crucial regarding judgments for the programs and their characteristics: (1) absolute standards as reflected by personal judgments, and (2) relative standards as reflected by characteristics of alternate programs (107-536).

The advantages of comparisons are related to relative judgments concerning a program. We can obtain

an overall or composite rating of merit (perhaps with certain qualifying statements) that can be used to make an educational decision judging a program relative to another similar-type program at another educational institution. It is hardly a judgmental matter to determine whether one program is superior to another with regard to a single characteristic, but there are many characteristics and the characteristics are not equally important. The evaluator selects which characteristics to attend to and which reference programs to compare to (107:538).

Evaluation Methodology

The concept of decision-based evaluation must be translated into a practical system in order to be useful to the educator. This system then provides a plan for the use of the evaluator. The evaluator, of course, serves as the tool of the decision maker.

In order for evaluation to serve as a basis for judging decision alternatives, it is first necessary to identify the decision to be served. Unless there is a possibility that two or more different actions might be taken in response to some situation requiring altered

action, then there exists no need for evaluation, as there is no decision need to be served.

Next, the evaluative information needed must be identified. An inventory of the possible alternatives leads to this information. Each alternative must be weighed and the criteria for this weighing must be identified.

The indentified information must be made available to the decision maker. This involves the process of collecting, organizing, and analyzing data for measurement and statistical analysis. The information must be put together into a system that will serve the purposes of the evaluation and report the information to the decision maker. The provision of such a system becomes the next step in evaluation.

In order for the information to be useful to the decision maker, it must satisfy "scientific, practical, and prudential criteria" (123:42). Thus, it should have internal and external validity, as well as reliability and objectivity. The information should also have relevance, importance, scope, credibility, and timeliness. The efficiency of the usefulness of the information is also important, as is its wide dissemination potential, in the form of evaluation findings.

This leads to the final step in evaluation, that of the actual use of the information by the decision maker for judging between two or more decision alternatives. This is the act of decision making, and without this final act, evaluation has not occurred, according to Stufflebeam's definition.

Development of a Comparative Evaluation System

Based on the definition of evaluation selected, as expanded and modified by the authors cited, an evaluation plan was adapted for use in this study. This plan included the following steps:

1. Decision to be served by evaluation was identified.
2. Domains of Information needed for the decision were identified.
3. Criteria were selected to measure the Domains of Information.
4. Actual decision makers involved were persuaded to serve as Panel to provide weights to the criteria selected.
5. Measures for the criteria selected were identified.

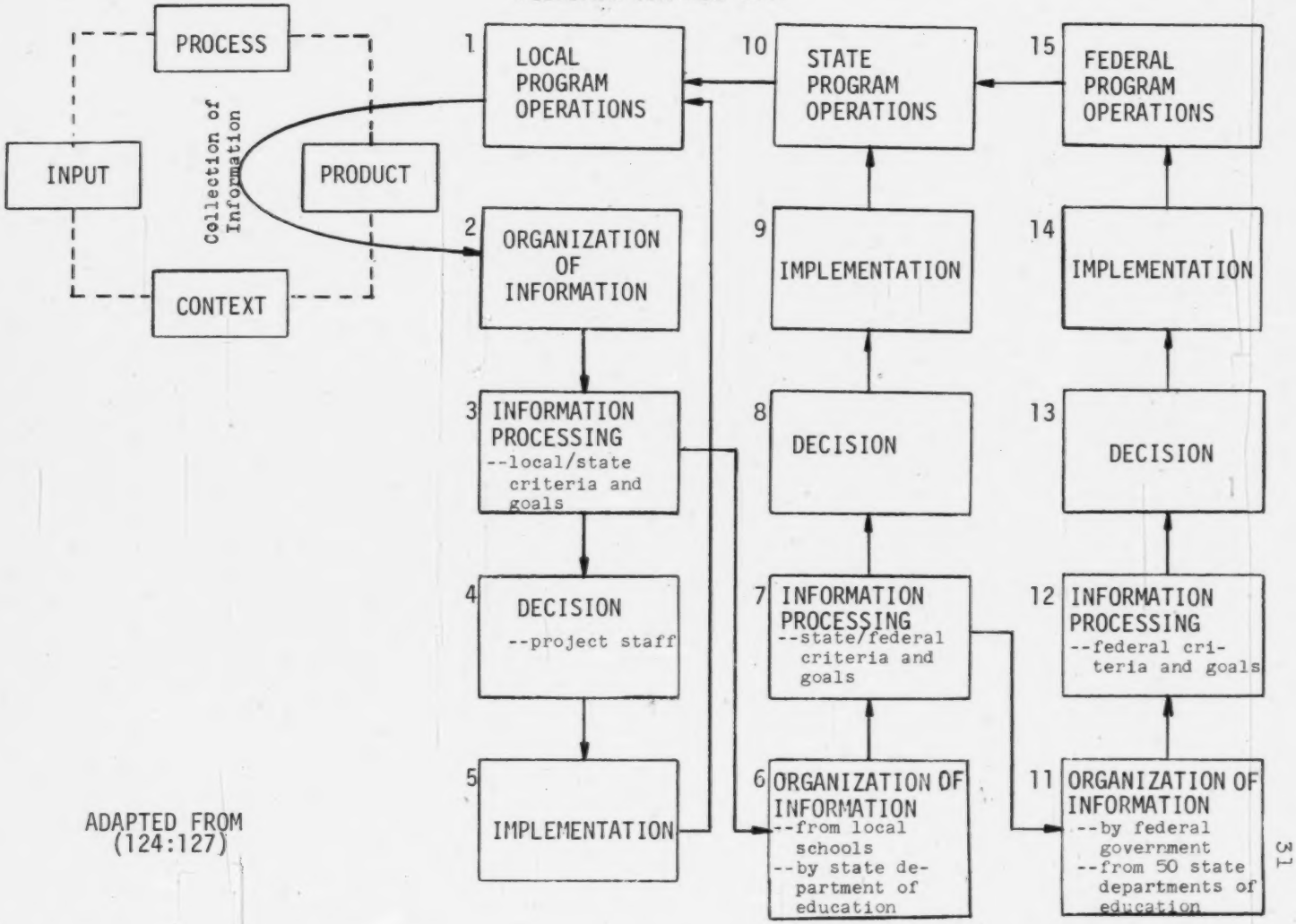
6. Panel of Decison Makers designated weights for the measures identified.
7. Data was collected for measures.
8. A systematic methodology was devised to provide the decision information to the decision makers in a useful manner.
9. Data and Information produced by this System were analyzed.
10. Recommendations were made to decision makers, thus additionally providing a Feedback Control Loop.

The Feedback Control Loop (final step) is a vital aspect of this functional evaluation system. Not only is this step essential for continuous refinement of educational programs, but the final act of judgment leading to a recommendation for action can be imposed with confidence only if such a continuous feedback is part of the information system.

Such a Feedback Control Loop has been illustrated by Stufflebeam and is shown on the next page as Figure 2. (This also shows the importance of recognizing the level of decision in evaluation planning.)

FIGURE 2

FEEDBACK CONTROL LOOP


PROCESS
INPUT
Collection of Information
PRODUCT
CONTEXT
1 LOCAL PROGRAM OPERATIONS
2 ORGANIZATION OF INFORMATION
3 INFORMATION PROCESSING --local/state criteria and goals
4 DECISION --project staff
5 IMPLEMENTATION
6 ORGANIZATION OF INFORMATION --from local schools --by state department of education
7 INFORMATION PROCESSING --state/federal criteria and goals
8 DECISION
9 IMPLEMENTATION
10 STATE PROGRAM OPERATIONS
11 ORGANIZATION OF INFORMATION --by federal government --from 50 state departments of education
12 INFORMATION PROCESSING --federal criteria and goals
13 DECISION
14 IMPLEMENTATION
15 FEDERAL PROGRAM OPERATIONS

ADAPTED FROM (124:127)

The Panel of Decision Makers

In the earlier discussion of the Stufflebeam evaluation steps, the study noted that the weight to be applied to each criteria for measurement was to be designated by the evaluator. However, as Stake points out, "Evaluators will seek out and record the opinions of persons of special qualification. These opinions, though subjective, can be very useful and can be gathered objectively, independent of the solicitor's opinion" (116:527).

Before making a judgment, the evaluator determines whether or not each standard is met. The judging act itself is deciding which set of standards to heed. More precisely, judging is assigning a weight, an importance, to each set of standards. Rational judgment in educational evaluation is a decision as to how much to pay attention to the standards of each reference group (point of view) in deciding whether or not to take some administrative action (116:536).

With this view of the judging act, the evaluator's determination of relative importance of the measures selected to provide the information needed for the decision would be best made by reference to the actual

opinions of the real decision makers involved. These would be the "persons of special qualification." Stated more simply, the best people to give relative weights to the measures in an evaluation are the decision makers to be served by that evaluation.

Therefore, this study did so designate the actual decision makers to be served by the study as a Panel of Decision Makers. This Panel was then given the responsibility of assigning the relative weights to the selected measures to be used in providing the desired decision information.

The following chapter will detail and specify the exact design and methodology chosen to provide the decision information needed for the problem of this study. The design and methodology are based on the conceptual framework outlined in this chapter.

C H A P T E R I I I

DESIGN AND METHODOLOGY FOR COMPARATIVE EVALUATION

This chapter presents the evaluation model adapted for the selected decision need of the Post-Secondary Division of the Department of Occupational Education and Technology at the Texas Education Agency. The developed Comparative Rating Scale Model is also explained in detail. Consecutive steps of the design methodology are listed with details of the sources and procedures used.

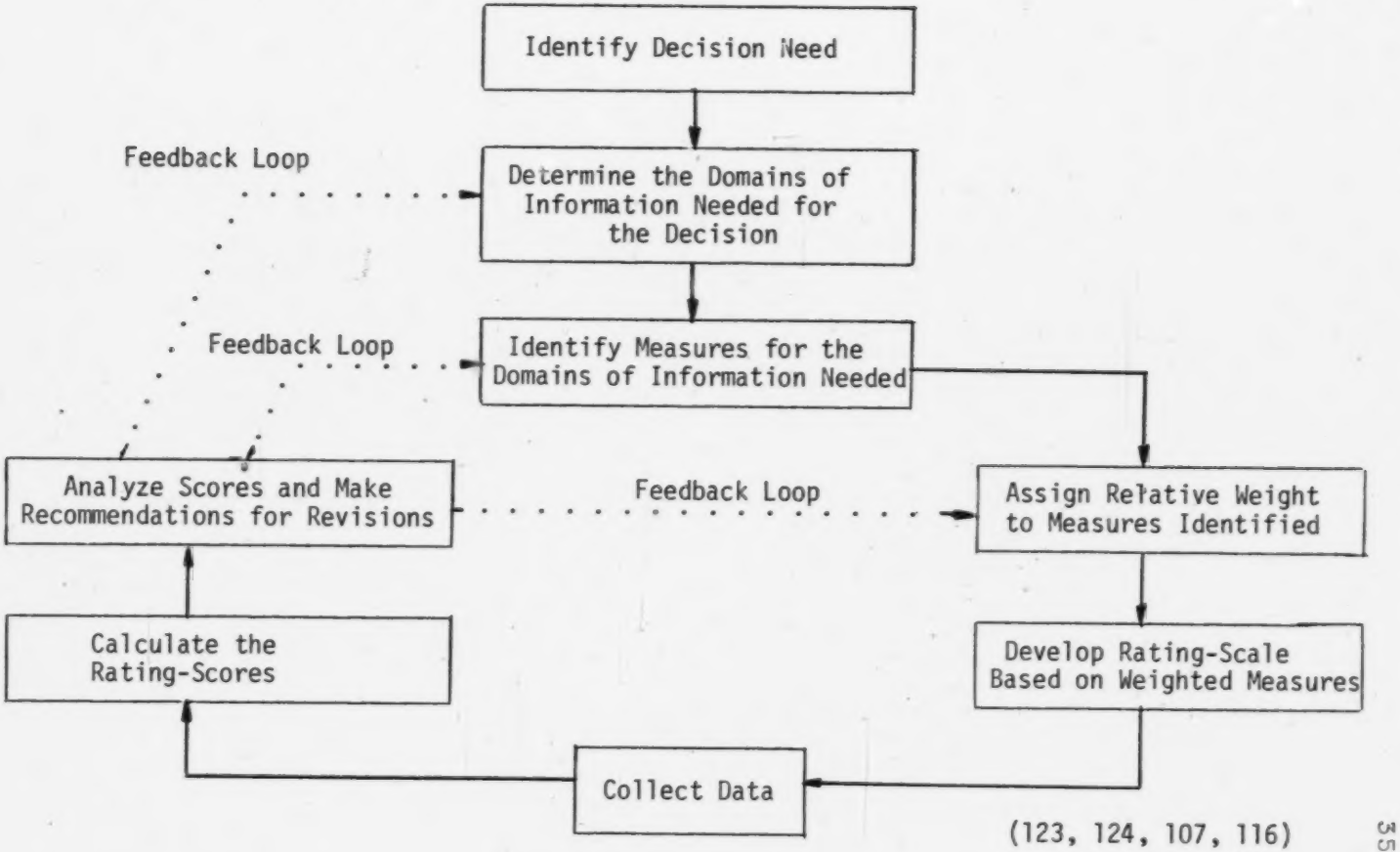
Design of the Study

An overview of the total comparative evaluation model adapted for this study's use may serve as an introductory guide to the design. This overview is presented graphically in Figure 3, "A Comparative Evaluation Model." (See next page.)

The general model shown in Figure 1 was made specific for the needs of this study as illustrated in Figure 4. (See Following page.) This illustration further

FIGURE 3

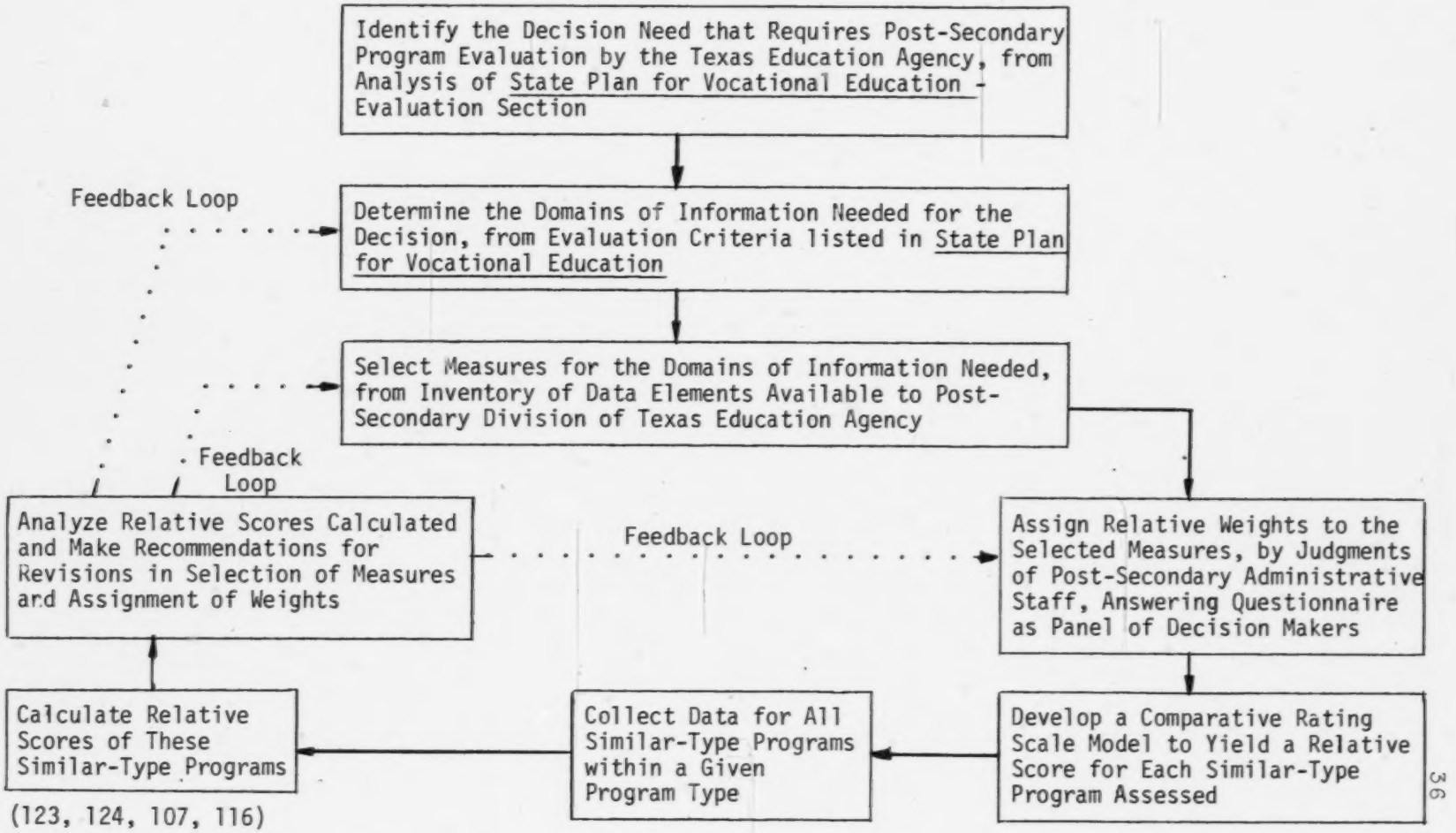
A COMPARATIVE EVALUATION MODEL


Identify Decision Need
Feedback Loop
Determine the Domains of Information Needed for the Decision
Feedback Loop
Identify Measures for the Domains of Information Needed
Analyze Scores and Make Recommendations for Revisions
Feedback Loop
Assign Relative Weight to Measures Identified
Calculate the Rating-Scores
Develop Rating-Scale Based on Weighted Measures
Collect Data

(123, 124, 107, 116)

FIGURE 4

COMPARATIVE EVALUATION MODEL FOR VOCATIONAL/TECHNICAL EDUCATION PROGRAMS IN THE PUBLIC COMMUNITY COLLEGES IN TEXAS


Identify the Decision Need that Requires Post-Secondary Program Evaluation by the Texas Education Agency, from Analysis of State Plan for Vocational Education - Evaluation Section
Feedback Loop
Determine the Domains of Information Needed for the Decision, from Evaluation Criteria listed in State Plan for Vocational Education
Select Measures for the Domains of Information Needed, from Inventory of Data Elements Available to Post-Secondary Division of Texas Education Agency
Feedback Loop
Analyze Relative Scores Calculated and Make Recommendations for Revisions in Selection of Measures and Assignment of Weights
Feedback Loop
Assign Relative Weights to the Selected Measures, by Judgments of Post-Secondary Administrative Staff, Answering Questionnaire as Panel of Decision Makers
Calculate Relative Scores of These Similar-Type Programs
(123, 124, 107, 116)
Collect Data for All Similar-Type Programs within a Given Program Type
Develop a Comparative Rating Scale Model to Yield a Relative Score for Each Similar-Type Program Assessed

adapts the model to show the specific steps taken by the study to produce a comparative evaluation of similar-type vocational and technical education programs being offered in the different public community colleges of Texas.

The remainder of the chapter will present a detailed description of the steps outlined in Figure 2, and will detail the methodology applied to produce the results obtained.

Decision Need

The Texas State Plan for Vocational Education (139) designates a State Board for Vocational Education. This State Board is assigned the responsibility of designating an Executive Officer. In practice, the Texas State Board of Education is concurrently designated as the State Board for Vocational Education, and the Texas Commissioner of Education serves as the Executive Officer of the State Board for Vocational Education.

The Executive Officer of the Board has the responsibility to recommend to the Board an annual budget based on the appropriations of the Legislature. The

Executive Officer is further authorized to appoint and delegate authority for specific portions of this annual budget to members of his staff charged with administration of certain educational programs. Such an arrangement exists regarding the allocation of appropriated funds for postsecondary vocational and technical education programs.

The administrators of the Post-Secondary Division allocate available funds to approved programs. The funding formula for each program type has legal standing, being a part of the appropriation legislation. However, the administrators of the Post-Secondary Division, together with a representative administrator from the Coordinating Board of the Texas College and University System, make the decision to approve and fund, or disapprove and withhold funds, from programs. This occurs via the action of the Joint Program Review Committee of the Texas Education Agency and the Coordinating Board.

The decision need providing the problem of this study concerns the possibility that future funding patterns may require elimination of some existing programs. Thus this decision may have to be made: "Given limited resources and similar-type programs at different public community colleges, which programs should be eliminated?"

The evaluation plan of this study is directed toward this decision need.

Domains of Information

The identified decision need requiring comparative evaluation of similar-type programs in different colleges led to further analysis of the State Plan for Vocational Education. In particular, the program evaluation section of the plan was examined for guidance in reference to designated criteria applicable to the need.

Section 1.54 of the State Plan describes "Evaluation Criteria." An analysis of these criteria suggested five domains of information relevant to the decision need of this study. The areas identified were: (1) the need for the program in the local area; (2) the response of the local area to the offering of the program; (3) the costs of the program; (4) the results of the operation of the program; and (5) the documentation of the program. These became the five domains of information to be used in the development of the comparative evaluation rating of programs.

The structure of the evaluation model (Figure 2) is such that other domains of information may be added,

substituted, or deleted, without difficulty. This insures sufficient flexibility to make the model easily adaptable to changes in the evaluation criteria that may be listed in future annual State Plans.

Selection of Measures

With the needed domains of information identified, the investigation began an inventory of available data elements to select measures that might provide the information desired. This search was restricted to files and records of the state-level educational supervisory agencies of Texas. The main reason for such a restriction was the desire to produce an evaluation system both practical and immediately useable. The considerable amount of reporting already required of the colleges involved also influenced the decision to utilize data either already available to the Texas Education Agency, or otherwise readily obtainable from other state-level sources.

Because of legally mandated federal reporting and state reports required for auditing purposes, a large accumulation of records now exists in the Post-Secondary Division of the Department of Occupational Education and

Technology at the Texas Education Agency. The records so compiled have served almost entirely as compliance documentation. (The reports were made to satisfy legal requirements.) Other information regularly reported to the Division serves as negotiation correspondence for annual funding levels at each college. Little, if any, evaluation of programs has ever been based on the documentation available, except for the initial consideration of a new program submitted for approval (67:2).

After a thorough examination of the various recurring data elements being annually supplied to the Division by individual colleges, the following documents were selected to provide the needed information for comparative evaluation of programs. Specific sections of these records were chosen as measures to provide the desired decision information.

A. Annual Application for Funds for Post-Secondary Occupational Programs. Each year the TEA Post-Secondary Division sends out a blank application to each college containing approximately thirty pages of forms and instructions. The format of this application has remained fairly constant from year to year, changing only as legal requirements and funding formulas change. In

actual usage, the real purpose of this application is to negotiate the college's level of vocational/technical funding for the year. No reference is made to these applications for any other purpose (70:1-3).

Six sections of the Annual Application were chosen to provide specific information for evaluation. These became measures of need, costs, and documentation.

One table from the Annual Application, "Employment Opportunities Related to Occupational Education Programs, Labor Demand and Supply Summary," supplied program data on (a) current employment in field, locally; (b) projected demand in field, locally; (c) projected supply in field, locally, from public education; and (d) projected supply in field, locally, from nonpublic education. These figures from college reports were used to measure the need for the program in the local area.

Another table from the Annual Application is called: "Occupational Program Planning and Budget Estimates." This table supplied an estimate of local funds planned for the individual program being evaluated. These figures were used as part measure of the costs of the program.

Finally, the existence of an approved Annual Application, listing data for the specific program in question, was used as part measure of the documentation of the program.

B. Enrollments in Vocational Education Programs. The United States Office of Education requires an annual report of information concerning vocational/technical education programs, statewide. It is necessary for the Post-Secondary Division to collect this information directly from the colleges in order to assemble it for reporting requirements.

One of the forms used for this purpose is the "Enrollments in Vocational Education Programs" format. This form (one or more pages long depending on the number of program offerings of the college) identifies each approved and funded vocational/technical education program by USOE Code Number. The total number of students enrolled in each program at the beginning of the academic year in question is given. This figure includes all students in both the first and second-year classes of two-year programs (or all students enrolled in a one-year program). This enrollment data was used as part measure of the response of the local area to the offering of the program being evaluated.

C. Placement of Program Completions in Vocational Educational Program. The USOE annual reporting also includes a follow-up study. TEA collects this information directly from the colleges at the same time each year that the USOE enrollment information is assembled. As with the enrollment form, individual vocational/technical education programs are identified by USOE Code Number on the follow-up form.

"Placement of Program Completions in Vocational Education Programs" provides a variety of follow-up data in its one-to-three-page length. Four sections of this form were utilized for this study. These became measures of the results of the operation of the program and of the documentation of the program.

The selected sections used as measures were: (1) completions; (2) left prior to normal completion time with marketable skills; (3) known to have been employed full-time in field trained or related field:, and (4) number known to be unemployed.

D. Texas Guidance Information Program. The Texas Guidance Information Program is a Texas adaptation of the "Specialty Oriented Student Research Program," designed by Kenneth B. Hoyt, now of the University of

Maryland. This study was a massive project done in Texas by TEA to provide guidance information to high school counselors regarding the many vocational/technical programs in Texas public community colleges.

No regular reporting systems exist in Texas to identify first-year students in vocational/technical education programs at the Postsecondary level. Although TEA approves entire programs, funding is done on a course by course basis. A typical program will include courses funded by TEA and courses funded by the Coordinating Board of the Texas College and University System.

In many colleges, students may enroll for courses that are part of a vocational/technical program without being actually program participants. Thus, it is not possible to determine the number of first-year students actually in a given program, with any exactitude, even from a check of class records.

However, the Texas Guidance Information Program sent high school counselors to each individual college campus. There, the college allowed them to physically assemble the actual first-year students enrolled in each vocational/technical education program. Thus, the headcount taken as a part of the TGIP research is the best

available information concerning the number of first-year students enrolled in the various programs at the time of the study.

This information concerning the number of first-year students enrolled in each program was then used as one of the measures of response of the local area to the offering of the program. Participation in TGIP was also included as one of the documentation measures.

E. Student Contact Hours Taught in Texas Public Junior Colleges. The staff of the Post-Secondary Division of the Texas Education Agency calculate and publish a "blue book" each year showing, for each college, the dollars produced by the student contact hours funded for the operation of each vocational/technical program of the college. This book is called the Student Contact-Hours Taught in Texas Public Junior Colleges.

Every program shows a record in this book, semester by semester, of the actual student contact hours taught in courses that are TEA funded and part of the program. These hours are totaled and multiplied by the current funding rate to arrive at the "Dollars Produced" figure for the program, for the year of the report.

The "Dollars Produced" figures for each distinct program at each college were used in this study as one of the measures of the costs of the program.

Assignment of Weights

Relative weights were assigned to each selected measure as the next step toward the development of this comparative evaluation system. The weighing process is another point where the system functions in a highly flexible manner. The weights given to each measure selected may be easily varied through the feedback loop of the evaluation model (see Figure 2).

In order to select the weights for the first comparative program evaluation to be made using the model, a Panel of Decision Makers on Post-Secondary Vocational/Technical Education Programs was chosen to give relative values to the measures designated.

To make the model as realistic as possible, the actual Texas decision makers for this education area agreed to serve as the Panel for the study. The Joint Program Review Committee (chief decision body on Post-Secondary Vocational/Technical Programs in Texas) is made

up of the administrative staff of the Post-Secondary Division of the Texas Education Agency and the Program Director for Community Colleges from the Coordinating Board, Texas College and University System. This Committee is the major decision-making body concerning postsecondary vocational/technical education programs in Texas.

The usual membership of the Committee includes the following administrators (supplemented from time to time by appropriate TEA specialists):

Texas Education Agency Post-Secondary Division	Coordinating Board Community College Programs
1. Director Joseph D. Godsey	4. Dr. Raymond Hawkins Director
2. Assistant Director James Haynie	
3. Chief-Consultant Roland A. H. Benson	

All four of these administrators agreed to participate in the study. Their participation took the form of completion of a questionnaire designed to provide relative weights for the measures selected (see Appendix C).

Every member of the Panel cooperated fully. Panel members' individual relative weights assigned were averaged to provide a single scale of weights to be applied

to the data collected concerning the measures selected. These weights were incorporated into the Comparative Rating Scale Model presented for the next step of the evaluation design.

Comparative Rating Scale Model

The model developed to actually provide the comparative rating of similar-type programs at different public community colleges gives this rating in the form of a single Program Rating Score. This Program Rating Score for each individual program may then be compared with the Program Rating Score for all other individual programs of the same given type, at all other Texas public community colleges.

The Program Rating Score is calculated on the basis of the selected and weighted measures designated by the study. The following section illustrates how a Rating Score is assigned to each measure (for each program).

Steps for Assigning a Rating Score for Each Measure

For each measure (for each program):

1. Determine range of raw scores for the measure, for all programs sampled.
2. Determine the number of raw scores in the range.
3. Determine the mean of the range of the actual raw scores.
4. Determine the standard deviation of the distribution of raw scores, for the measure's raw scores, for all programs sampled.
5. Determine the individual raw score for the measure, for the individual program being evaluated.
6. Convert the individual raw score into a Z-Score as follows:

$$\text{Z score} = \frac{\left[\text{(actual raw score)} - \text{(mean of the range of actual raw scores)}\right]}{\text{(standard deviation of the actual distribution of raw scores)}}$$

7. Convert the Z-Score into a Standard Score as follows:

Standard Score =

[(Z-Score)(Standard Deviation=10)] + (Mean=50)

8. Convert the Standard Score into a Weighted Score as follows:

Weighted Score = (Standard Score) (Weight assigned to Measure)

The only exception to the methodology described concerns those measures where a lower raw score indicates a higher evaluation score. In the case of these measures, an additional step was taken between steps 5 and 6 of the calculations. This step was as follows: Subtract the individual raw score for the measure from the highest of range of raw score, in order to reverse the range.

[The measures requiring this reverse of range were: (1) projected supply in field, locally, from public education; (2) projected supply in field, locally, from nonpublic education; (3) program's contact-hour dollars earned; and (4) students known to be unemployed.]

By following the steps outlined for each measure for each program, a set of Measure Rating Scores may be determined for each program evaluated. The SUM of these Measure Rating Scores, for each program evaluated, will then provide a Program Rating Score for each program.

When the Program Rating Scores are determined for all programs within a given-type program area, then

a comparative evaluation of these similar-type programs being offered at different public community colleges becomes possible.

The Program Rating Scores are so designed within the system as to produce a mean score of 50, with a standard deviation of 10. (The model could easily be changed to provide a mean and standard deviation at any level desired for the comparison.)

Data Collection

In order to provide a trial for the Comparative Rating Scale Model, the study sampled community college programs in each of the seven major occupational cluster groups used by the United States Office of Education (152). These groups are: (1) agriculture, (2) health, (3) homemaking, (4) office, (5) distribution and marketing, (6) technical, and (7) industrial.

Within each occupational cluster group, a given type program was selected for study. Then, within operational definitions, all similar programs of this given type being offered in all the public community colleges of the state of Texas were analyzed on the basis of the

selected measures in order to calculate a Program Rating Score for each of the 51 programs chosen. This allowed a rank ordering of similar type programs in different public community colleges on the basis of the Comparative Rating Scale Model.

The following type programs were chosen for evaluation because of their numerical and geographical distribution: (1) agriculture--Farm and Ranch Management; (2) health--Associate Degree Nursing; (3) homemaking--Interior Design; (4) office--Stenographic and General Secretarial; (5) distribution and marketing--Mid-Management; (6) technical--Electronics Technology; and (7) industrial--Automobile Mechanics.

Following operational definitions, Table 1 shows exactly which specific educational programs were selected for the study. A total of 51 programs, being offered through 27 colleges, were chosen, surveyed, and rated. A 100 percent participation and return were insured by total access to all state-level records for the period sampled. (Table 1 is presented on the following pages.)

TABLE 1

SPECIFIC PROGRAMS SELECTED FOR
COMPARATIVE EVALUATION

Agriculture: Farm and Ranch Management

Central Texas College
Henderson County Junior College
Paris Junior College
Southwest Texas Junior College

Health: Associate Degree Nursing

Amarillo College
Angelina College
Central Texas College
El Centro College
Grayson County College
Kilgore College
Laredo Junior College
McLennan Community College
Odessa College
Tarrant County Junior College
Texarkana Community College

Homemaking: Interior Design

El Centro College
San Jacinto College

Office: Stenographic and General Secretarial

Brazosport College
Central Texas College
El Centro College
Henderson County Junior College
McLennan Community College
South Plains College
Tarrant County Junior College (S)
Tarrant County Junior College (NE)

TABLE 1 (continued)

Distribution and Marketing: Mid-Management

Amarillo College
Eastfield College
El Centro College
Mountain View College
Kilgore College
McLennan Community College
Paris Junior College
Odessa College
Temple Junior College

Technical: Electronics Technology

Amarillo College
Eastfield College
Navarro Junior College
Odessa College
San Antonio College
St. Philip's College
San Jacinto College
Tarrant County Junior College
Tyler Junior College
Wharton County Junior College

Industrial: Automobile Mechanics

Amarillo College
Eastfield College
Grayson County College
Southwest Texas Junior College
Tarrant County Junior College
Texas Southmost College
Wharton County Junior College

Calculations

All of the selected measures were collected for all the sample programs listed in Table 1 for sample period operationally defined in Chapter I. On the basis of these data, the calculations outlined under "Steps for Assigning a Rating Score for Each Measure" were applied to yield a Program Rating Score for each of the 51 programs. These scores were then arranged so as to provide a comparative rank ordering of all similar type-programs within each given program area. This, then, yielded comparative evaluation of similar type vocational/technical education programs being offered at different Texas public community colleges, in trial form.

Data Analysis and Recommendations

Systematic examination of the comparative evaluation results produced led to recommendations which were presented to the Panel of Decision Makers as feedback for future revision. The flexibility features of the format were stressed with the recommendations, and the interchangeable elements of the model were fully identified for maximum utilization in any actual future field use of the design.

C H A P T E R I V

TRIAL OF COMPARATIVE RATING SCALE MODEL

Introduction

The Comparative Rating Scale Model developed in this study was given a trial in order to assess its practical usefulness as an evaluation tool. Using the domains of information, criteria measures, and weights selected through the process described in Chapter III, an actual comparative evaluation study was done. This study developed a rank ordering of similar type vocational and technical education programs being offered at different public community colleges in Texas.

Within the operational definitions of the study, all similar type programs within each selected field were so rank ordered on the basis of the Comparative Rating Scale Model developed. This chapter presents these comparative evaluations.

It is important to note that this trial of the Model depends on the quality of the measures selected for its effectualness. Use of the Model for real evaluations

leading to actual decisions concerning the programs sampled would require considerable revision through continuous feedback.

The selection of the domains of information, the designation of criteria, the identification of measures (or design of new measures), and the assignment of weights may all be changed repeatedly as a result of feedback. Thus, the model is intended as an evaluation framework which may provide an objective methodology for comparative assessment of programs through a continuous refinement of each of the principal elements of the design.

Sample Selection

In order to give the Model a comprehensive trial, one type of occupational education program was selected from each of the seven occupational clusters used by the United States Office of Education to categorize vocational and technical programs (152).

The program type chosen for each occupational cluster was selected on the basis of an overview of all vocational and technical education being offered in the

public community colleges of Texas (136). Within operational definitions, the most widespread programs, both geographically and numerically, were selected to represent their occupational clusters.

Table 1 of Chapter III has listed these programs. In this chapter, Table 2 again lists the colleges and programs used for the study, assigning identification numbers and letters for use on subsequent tables presenting the data collected and processed.

Variables

Each of the measures selected for use in the Model's trial run have been described in Chapter I and Chapter III. Table 3 assigns numbers to these variables with brief descriptive notes for reference.

Although a considerable portion of the data used comes from self reports of the colleges sampled, the broad scope of this study, and its limitations of resources, make the use of such data essential.

Since the central purpose of the study was to provide an instrument with practical usefulness to the staff of the Post-Secondary Division, Department of Occupational Education and Technology, Texas Education

TABLE 2

COLLEGE IDENTIFICATION NUMBERS

1. Amarillo College
2. Angelina College
3. Brazosport College
4. Central Texas College
5. Eastfield College
6. El Centro College
7. Mountain View College
8. Grayson County College
9. Henderson County Junior College
10. Kilgore College
11. Laredo Junior College
12. McLennan Community College
13. Navarro Junior College
14. Paris Junior College
15. Odessa College
16. San Antonio College
17. St. Philip's College
18. San Jacinto College
19. South Plains College
20. Southwest Texas Junior College
21. Tarrant County Junior College (S)
22. Tarrant County Junior College (NE)
23. Temple Junior College
24. Texarkana Community College
25. Texas Southmost College
26. Tyler Junior College
27. Wharton County Junior College

PROGRAM TYPE IDENTIFICATION LETTERS

A. Farm and Ranch Management
B. Associate Degree Nursing
C. Interior Design
D. Stenographic and General Secretarial
E. Mid-Management
F. Electronics Technology
G. Auto Mechanics

TABLE 3

Variables

Measure Numbers

1. Local Current Employment in Field
2. Local Projected Demand in Field
3. Local Projected Supply in Field from Public Sources
4. Local Projected Supply in Field from Other Sectors
5. Enrollment of First-Year Students
6. Enrollment of First-Year and Second-Year Students
7. State Funding of Program
8. Local Funding of Program
9. Program Completions
10. Students Leaving Prior to Completion with Marketable Skill
11. Students Employed Full-Time in Field Trained
12. Students Known to be Unemployed
13. Annual Application for Funds Submitted by School*
14. United States Office of Education Enrollment Reported Submitted by School*
15. United States Office of Education Follow-Up Report Submitted by School*
16. Texas Guidance Information Program Participation by School*

(*Compliance with this documentation measure is signified on tables of raw scores of measures by the letter "D" indicating that such documentation was submitted by the schools sampled. In further calculations of rank orders, these "D"'s are treated as raw score of 1.)

Agency data sources were limited to those available to the Division at the time of this study.

There are a variety of informal intraagency cross-checks concerning the accuracy of the figures submitted by the colleges for Variables 1 through 4. Variable 5 is made up of data collected independently of the colleges. Variables 6 through 8 are regularly audited by other state agencies. Variables 13 through 16 are verifiable through TEA audits.

Only the Follow-Up Study variables of 9 through 12 rely completely on the local education agencies for accuracy. In these cases, the data so supplied by the colleges are not only the best available, but the only available statistics for this important domain of information.

Data Collection

Complete cooperation of the Texas Education Agency resulted in total access to Agency files and records. As a result of this facility, it was possible to collect and compile all raw scores for the selected measures for all designated programs in the colleges chosen for the period of the study.

The data thus collected for the trial run of the Model is shown in Tables 4 through 10 in the form of a set of raw scores for all variables for all programs for all colleges. (See Tables 2 and 3 for identification numbers and letters concerning colleges, programs, and measures of variables.)

Table 11 shows the Range of Raw Scores for the variables. (The scores in parentheses show the next-to-lowest score within the range for each variable.) Additionally, Table 12 shows the mean and standard deviation of the distribution of raw scores for each variable. The Comparative Rank Order calculations for the program types sampled are based on the data given in Tables 4 through 12.

Weights Assigned by Panel of Decision Makers

As stated in Chapter III, complete cooperation was given by all Panel Members in assigning of relative weights to the measures identified for evaluation purposes. Through the questionnaire shown in Appendix C, the sixteen measures were given individual weights relative to each other in such a way as to provide a total

TABLE 4

RAW SCORES OF MEASURES

A. Farm and Ranch Management

Measure Numbers	College Numbers			
	4	9	14	20
1	2,196	2,500	3,500	2,649
2	2,256	2,600	15	1,318
3	27	10	15	198
4	0	25	0	4
5	30	30	30	36
6	72	40	66	72
7	16,477	21,268	13,910	52,640
8	3,788	6,232	2,227	4,500
9	3	10	2	20
10	0	4	1	28
11	1	10	3	20
12	0	0	0	1
13	D	D	D	D
14	D	D	D	D
15	D	D	D	D
16	D	D	D	D

TABLE 5

RAW SCORES OF MEASURES

B. Associate Degree Nursing Programs

Measure Numbers	College Numbers										
	1	2	4	6	8	10	11	12	15	21	24
1	37,642	6,620	35,261	130,400	3,264	1,319	518	14,220	815	14,711	1,860
2	38,370	100	36,214	137,600	3,365	207	25	0	950	883	60
3	497	30	0	100	100	20	25	0	100	98	0
4	50	20	0	50	0	187	25	0	50	723	0
5	33	35	32	51	34	34	38	86	36	40	30
6	129	73	99	317	105	49	46	212	61	206	144
7	69,306	57,766	48,513	174,421	86,214	45,062	43,009	83,070	103,288	113,614	80,258
8	20,747	11,266	8,278	12,329	13,235	16,649	19,100	22,862	29,959	9,600	19,823
9	35	22	8	53	34	24	13	37	27	44	16
10	0	0	0	10	3	0	0	14	0	23	5
11	35	18	8	47	34	22	13	32	25	27	20
12	0	0	0	1	0	0	0	0	0	1	0
13	D	D	D	D	D	D	D	D	D	D	D
14	D	D	D	D	D	D	D	D	D	D	D
15	D	D	D	D	D	D	D	D	D	D	D
16	D	D	D	D	D	D	D	D	D	D	D

TABLE 6

RAW SCORES OF MEASURES

C. Interior Design

Measure Numbers	College Numbers	
	6	18
1	130,400	400
2	137,600	50
3	100	20
4	50	10
5	31	33
6	70	82
7	0	0
8	1,644	6,841
9	0	4
10	0	0
11	0	3
12	0	0
13	D	D
14	D	D
15	D	D
16	D	D

TABLE 7

RAW SCORES OF MEASURES

D. Stenographic and General Secretarial

Measure Numbers	College Numbers							
	3	4	6	9	12	19	21	22
1	1,504	35,261	177,700	294	14,220	300	6,428	6,428
2	132	36,214	185,700	302	0	40	411	411
3	97	0	1,250	20	0	61	125	125
4	20	0	1,000	5	0	0	200	200
5	33	31	36	31	33	31	35	30
6	268	256	535	145	122	74	274	167
7	53,437	59,322	76,223	22,452	53,098	41,230	78,209	78,209
8	9,699	6,888	10,718	7,724	26,028	6,075	3,600	3,600
9	6	229	6	6	17	52	20	9
10	2	0	3	13	3	36	107	70
11	1	217	5	7	10	44	84	44
12	0	4	0	2	0	8	2	2
13	D	D	D	D	D	D	D	D
14	D	D	D	D	D	D	D	D
15	D	D	D	D	D	D	D	D
16	D	D	D	D	D	D	D	D

TABLE 8

RAW SCORES OF MEASURES

E. Mid-Management

Measure Numbers	College Numbers								
	1	5	6	7	10	12	14	15	23
1	37,000	78,900	78,900	78,900	5,864	14,220	480	2,480	1,759
2	37,370	82,400	82,400	82,400	655	0	15	3,480	175
3	431	150	150	150	103	0	12	120	33
4	15	50	50	50	552	0	3	50	67
5	33	32	31	30	31	20	33	29	30
6	48	143	173	61	56	90	119	139	77
7	48,242	48,819	66,909	29,451	37,989	29,040	31,875	44,586	25,217
8	4,577	3,135	5,054	2,806	3,655	8,132	2,080	8,870	4,391
9	7	3	19	0	12	62	1	7	8
10	0	0	8	4	2	16	10	0	6
11	7	1	12	4	8	70	9	5	1
12	0	0	0	0	0	0	0	0	1
13	D	D	D	D	D	D	D	D	D
14	D	D	D	D	D	D	D	D	D
15	D	D	D	D	D	D	D	D	D
16	D	D	D	D	D	D	D	D	D

TABLE 9

RAW SCORES OF MEASURES

F. Electronics Technology

Measure Numbers	College Numbers									
	1	5	13	15	16	17	18	21	26	27
1	16,050	57,100	10,100	7,900	14,700	14,700	900	15,000	915	2,117
2	16,050	58,200	10,100	8,500	15,066	15,066	40	400	85	54
3	67	150	8	300	910	910	30	53	35	20
4	0	50	0	50	720	720	0	250	0	34
5	33	35	33	31	34	33	33	42	33	33
6	72	176	67	105	169	112	442	199	134	55
7	48,242	36,644	25,019	7,455	88,505	38,793	93,212	73,120	64,233	26,767
8	9,183	1,782	6,550	38,861	15,681	15,681	13,423	5,105	4,726	5,909
9	12	0	7	6	10	3	26	9	82	7
10	8	0	4	0	4	0	217	56	0	2
11	17	0	6	4	12	1	131	36	52	4
12	2	0	0	0	0	0	0	3	0	1
13	D	D	D	D	D	D	D	D	D	D
14	D	D	D	D	D	D	D	D	D	D
15	D	D	D	D	D	D	D	D	D	D
16	D	D	D	D	D	D	D	D	D	D

TABLE 10

RAW SCORES OF MEASURES

G. Auto Mechanics

Measure Numbers	College Numbers						
	1	5	8	20	21	25	27
1	37,642	57,100	3,261	243	3,225	0	2,117
2	38,370	58,200	3,350	151	140	0	54
3	497	150	0	15	50	14	20
4	50	50	0	0	60	0	34
5	33	37	34	37	33	29	31
6	26	118	45	55	68	54	36
7	69,272	28,625	23,157	33,989	34,452	41,414	24,711
8	15,164	3,597	2,450	4,500	2,040	6,600	5,701
9	16	11	11	10	0	15	10
10	13	0	6	2	0	5	2
11	29	11	16	10	0	10	8
12	0	0	0	1	0	2	3
13	D	D	D	D	D	D	D
14	D	D	D	D	D	D	D
15	D	D	D	D	D	D	D
16	D	D	D	D	D	D	D

TABLE 11

RANGE OF RAW SCORES

Variable 1:	0	(	243)	-	177,700
Variable 2:	0	(	15)	-	185,700
Variable 3:	0	(	8)	-	1,250
Variable 4:	0	(	3)	-	1,000
Variable 5:	20			-	86
Variable 6:	26			-	535
Variable 7:	0	(7,455)		-	174,421
Variable 8:	1,644			-	38,861
Variable 9:	0	(	1)	-	229
Variable 10:	0	(	1)	-	217
Variable 11:	0	(	1)	-	217
Variable 12:	0	(	1)	-	8
Variable 13:	Documented				
Variable 14:	Documented				
Variable 15:	Documented				
Variable 16:	Documented				

TABLE 12

MEAN AND STANDARD DEVIATION OF DISTRIBUTION OF RAW SCORES OF VARIABLES

Variable	Mean	Standard Deviation
1	22,908	38,130
2	21,520	40,933
3	145	253
4	107	223
5	34.16	8.48
6	128	101
7	50,799	31,636
8	9,472	7,874
9	20.61	34.34
10	13.47	35.01
11	23.41	36.77
12	0.6667	1.4236
13	1	0
14	1	0
15	1	0
16	1	0

weight of 100. Each panel member did this. The results of these questionnaires were then translated so that the total of all weights assigned for all variables by each member of the Panel would equal "1."

The relative measure weights of each Panel member were averaged together in order to provide one set of weights. These individual and averaged weights are illustrated in Table 13.

In accordance with the methodology described in detail in Chapter III, under "Steps for Assigning a Rating Score for Each Measure," the weights provided by the averaging of the judgments of the Panel were used to calculate the Comparative Rank Order of the programs sampled.

Calculations of Comparative Rank Order of Similar Type Programs

The actual calculations necessary for the trial run of the Comparative Rating Scale Model followed the steps outlined in Chapter III. Briefly reviewed, these steps were as follows:

(a) Convert raw scores to Z-Scores

$$\text{Z-Score} = \frac{(\text{Raw Score}) - (\text{Mean})}{(\text{Standard Deviation})}$$

TABLE 13

WEIGHTS ASSIGNED TO MEASURES BY PANEL OF DECISION MAKERS

Variable	Panel Members				Average
	Godsey	Hawkins	Haynie	Benson	
1	.020	.050	.100	.122	.073
2	.150	.100	.100	.081	.108
3	.040	.100	.050	.081	.068
4	.030	.050	.050	.081	.053
5	.060	.050	.150	.033	.073
6	.060	.100	.100	.065	.081
7	.020	.050	.050	.082	.051
8	.020	.100	.050	.082	.063
9	.080	.100	.050	.016	.062
10	.120	.100	.050	.016	.071
11	.170	.050	.150	.016	.096
12	.050	.050	.050	.016	.041
13	.050	.025	.010	.114	.050
14	.050	.025	.015	.049	.035
15	.060	.025	.015	.065	.041
16	.020	.025	.010	.081	.034
	1.000	1.000	1.000	1.000	1.000

(b) Convert Z-Scores to Standard Scores

Standard Score = [(Z-Score)(SD of 10)]
+(Mean of 50)

(c) Convert Standard Scores to Weighted Scores

Weighted Score = (Standard Score)(Weight)

(d) Add the Weighted Scores

(e) Sum of Weighted Scores = Program Rating Score

(f) Rank Order the Program Rating Scores of all similar-type programs

(g) Rank Order = Comparative Evaluation of similar type programs being offered at different public community colleges in Texas.

Results of Trial of Comparative Rating Scale Model

The actual Rank Order produced through the trial run of the Comparative Rating Scale Model is shown in table form on the following pages. Each of the program types selected are grouped together, and the similar-type programs of the different colleges are compared and ranked on the basis of their Program Rating Scores. These results are displayed in Tables 14 through 20.

TABLE 14

COMPARATIVE EVALUATION RANK ORDER

Program Type: Farm and Ranch Management

Rank	College	Program Rating Score
1st	Southwest Texas Junior College	56.09
2nd	Henderson County Junior College	55.82
3rd	Central Texas College	55.52
4th	Paris Junior College	55.43

TABLE 15

COMPARATIVE EVALUATION RANK ORDER

Program Type: Associate Degree Nursing
Field: Health Occupations

Rank	College	Program Rating Score
1st	El Centro College	64.81
2nd	McLennan Community College	63.75
3rd	Amarillo College	58.43
4th	Central Texas College	57.61
5th	Odessa College	57.34
6th	Texarkana Community College	57.20
7th	Laredo Junior College	57.13
8th	Angelina College	56.66
9th	Kilgore College (tie with 8th rank)	56.66
10th	Grayson County College	56.52
11th	Tarrant County Junior College (S)	56.25

TABLE 16

COMPARATIVE EVALUATION RANK ORDER

Program Type: Interior Design
Field: Homemaking

Rank	College	Program Rating Score
1st	El Centro College	61.33
2nd	San Jacinto College	56.34

TABLE 17

COMPARATIVE EVALUATION RANK ORDER

Program Type: Stenographic and General Secretarial
Field: Office Occupations

Rank	College	Program Rating Score
1st	Central Texas College	66.80
2nd	El Centro College	62.09
3rd	Tarrant County Junior College (S)	59.92
4th	McLennan Community College	58.39
5th	Brazosport College	57.01
6th	Tarrant Count Junior College (NE)	56.64
7th	Henderson County Junior College	56.22
8th	South Plains College	55.66

TABLE 18

COMPARATIVE EVALUATION RANK ORDER

Program Type: Mid-Management
Field: Distribution and Marketing Occupations

Rank	College	Program Rating Score
1st	El Centro College	59.56
2nd	Eastfield College	58.81
3rd	Mountainview College	58.37
4th	McLennon Community College	58.35
5th	Paris Junior College	56.10
6th	Temple Junior College	56.67
7th	Odessa College	55.57
8th	Amarillo College	55.18
9th	Kilgore College	54.00

TABLE 19

COMPARATIVE EVALUATION RANK ORDER

Program Type: Electronics Technology
Field: Technical

Rank	College	Program Rating Score
1st	San Jacinto College	66.60
2nd	Tyler Junior College	58.59
3rd	Odessa College	58.34
4th	Eastfield College	58.28
5th	Tarrant County Junior College (S)	57.59
6th	Navarro Junior College	56.51
7th	Amarillo College	56.38
8th	Wharton County Junior College	55.43
9th	St. Philip's College	53.79
10th	San Antonio College	52.76

TABLE 20

COMPARATIVE EVALUATION RANK ORDER

Program Type: Automobile Mechanics
Field: Industrial

Rank	College	Program Rating Score
1st	Eastfield College	57.36
2nd	Amarillo College	56.92
3rd	Grayson County College	56.22
4th	Southwest Texas Junior College	55.80
5th	Texas Southmost College	55.02
6th	Tarrant County Junior College (S)	55.01
7th	Wharton County Junior College	54.72

One should remember that these comparative evaluations are a model trial intended to serve as a demonstration of the framework and methodology of the Comparative Rating Scale Model. Thus, the scores and rank orders produced are feedback for further refinements of the model that could lead possible future users to considerable revisions of domains, criteria, measures, and weights, before field use.

Throughout this study, the Comparative Rating Scale Model has been constructed with a view to providing an evaluation instrument that is flexible enough to allow constant revision. In other words, this Model is a framework built to hold a variety of interchangeable parts so that elements of the design may be easily and rapidly altered without changing the design as a whole.

The trial run of the model presented in this chapter was based on selected data elements chosen as this run's measures. Following the plan outlined in Figure 4 of Chapter III, the concluding chapter of this study will examine the comparative evaluations produced by the run of the model, and make recommendations for revision as feedback to the Panel of Decision Makers and the Post-Secondary Staff of the Texas Education Agency, identifying strengths and weaknesses found in the system.

C H A P T E R V

FEEDBACK LOOP: RECOMMENDATIONS FOR REVISION

Introduction

Four major elements of the Comparative Rating Scale Model are designed for feedback input. Each of these elements will accept a wide variety of determinants interchangeably. This design allows maximum flexibility for the Model and assures that essential revisions can be made simply and easily. The following view expands the plan in Chapter III.

After identification of the decision need to be served by the evaluation, four major steps are required by the Model. Each of these steps concerns a Model element receptive to feedback for revision. These steps are:

(1) determining the Domains of Information needed for the decision,

(2) determining the Criteria to be used in making judgments concerning the Domains of Information,

(3) selecting the Measures of the Criteria, and

(4) assigning relative Weights to the selected measures.

Thus, feedback may lead to revision of the Domains of Information, the Criteria, the Measures, and the Weights used, each time the Model functions. This final chapter will demonstrate the Model's feedback loop by presenting recommendations for revision based on the trail run described in Chapter IV.

Domains of Information

Given a decision need requiring comparative evaluation, the selection of the Domains of Information in this study was based on the Texas State Plan for Vocational Education. (140)

The State Plan contains a section called "Program Evaluation." For the purposes of the trial run of the Model, the Domains of Information needed for the decision required were chosen from the "Description of Evaluation" given in the Program Evaluation section:

> Evaluations will be conducted to determine the extent to which programs, services, and activities continue to be:
>
> > Realistic in the light of actual or reliably anticipated opportunities for gainful employment in the area served by the local educational agency.

> Suited to the needs, interests, and ability of students to benefit from the program in which they are enrolled in terms of acquiring the knowledge and skills necesary for (1) making informed and meaningful occupational choices; (2) enrollment in advanced technical educational programs; (3) entry upon and success in employment in the occupations for which they are trained.
>
> Effective regarding the placement of successful employment of students--after completion of the program in which they were enrolled--in the occupation for which they were trained or in closely related occupations. Local educational agencies are reauired to maintain follow-up records on all students enrolled in each program regarding the placement and employment of students, numbers entering college instead of employment, and other follow-up information. (140:44)

From this section, general domains of information needed were identified. These domains were (1) local needs, (2) curriculum and student population characteristics known, and (3) the placement of graduates of programs. The trial run of the model developed criteria and measures based on these domains adapted from the State Plan.

The Texas State Plan for Vocational Education is itself revised annually. The first recommendation for revision suggested by this study concerns the value of bringing additional evaluation expertise to bear on the

preparation of the Program Evaluation section of this State Plan.

Although decision information needs are briefly described in the Description of Evaluation quoted, it seems probable that additional interface between decision makers and evaluation planners could lead to a more comprehensive statement for the State Plan. A revised and more clearly delineated section under this Description of Evaluation should lead to a more effectual selection of domains of information for evaluation needs.

Criteria

In addition to the quoted Description of Evaluation used for identification of the Domains of Information, the State Plan's Program Evaluation section also contains "Evaluation Criteria:"

> Evaluation Criteria
>
> For each type of evaluation of vocational programs, services, and activities conducted, the following criteria shall be utilized:
>
> (1) relevance of priority areas in vocational education as specified in the long-range program and to vocational education programs, services, and activities described in the annual plan, (2) impact of program on local and/or state job opportunities and

> manpower needs as identified in the annual plan and long-range plan, (3) the degree to which the needs of all population groups on all levels in all geographic areas in all communities with special emphasis on the disadvantaged, handicapped, unemployed youth, and school dropout are being met, (4) impact of program on vocational education needs, (5) impact of program on new and emerging manpower needs and job opportunities, (6) adequate facilities for the operation of the program, (7) maintaining appropriate records (fiscal and follow-up) and supporting documents as required by the State Plan, (8) reasonableness of cost in relation to accomplishment, and (9) ratio of student objectives and occupational placement. (140:45-46)

It was necessary to make a selective and adaptive choice from these Criteria in order to meet the needs of the evaluation for measurable information concerning the domains already identified. Thus the Criteria outlined in Chapters I and III were used: (1) need for program in local area, (2) response of the local area to the offering of the program, (3) costs of the program, (4) results of the program, and (5) documentation of the program.

The choice of these Criteria from the statement of Evaluation Criteria in the State Plan was also influenced by the decision to utilize data either already available to the Texas Education Agency, or otherwise readily obtainable from other state-level sources. Without this limitation, in future field usage of this evaluation system, an expansion of criteria may be desirable.

Again, a revised and more clearly delineated State Plan statement seems desirable for Evaluation Criteria. Additional participation by the decision makers seems particularly important for this planning area.

Both the Description of Evaluation, and the Evaluation Criteria of the State Plan (Domains of Information and Criteria, in the Model) would benefit from systematic and expert restatement, accomplished through improved interface between evaluation planners and decision makers. Such improvement could lead to more objective and effective program evaluation.

Measures

Based on the Criteria identified from the State Plan, measures were selected from an inventory of the currently available data elements familiar to the decision makers concerned.

Four documents were chosen to supply these data: (1) "Annual Application for Funds for Post Secondary Occupational Programs," (2) "Enrollments in Vocational Education Programs," (3) "Placement of Program Completions in Vocational Education Programs," and (4) the "Texas Guidance

Information Program," (all of these were described in detail in Chapter III).

Within each of these documents, certain elements were selected as measures for the Criteria chosen. (These elements are also described in Chapter III.) This measure selection is crucial to the evaluation process. It is also the most obvious revision point.

The trial run of the model revealed a lack of sufficient input by decision makers in the selection of the measures to use for the Criteria. Although the Questionnaire to the Panel of Decision Makers made provision for additional input from the Panel members concerning measure selection, their response to their opportunity was minimal. Only one Panel member suggested that an additional measure was needed, and he was not able to specify an acceptable data source for it.

Future use of the Model should include cooperative evaluation planning in the selection of the measures to be used. Evaluator - Decision Maker interface seems essential in choosing measures. A comprehensive inventory of data elements prepared by the evaluator might be used by the Panel of Decision Makers in a preliminary selection of Measures for Criteria prior to the preparation of the

Questionnaire used to obtain the Panel judgments concerning relative Weights for the Measures.

Additionally, new components needed for evaluation might be identified by structured evaluator--Panel discussion which could lead to the development of new instruments for data collection.

Finally, a thorough reexamination of the format of the Annual Application form and the USOE reporting system could lead to new data collection forms still within the existing system. The specific requirements of the program evaluation could be met without requiring new reports from the colleges.

Weights

In the trial run of the Model, the relative Weights used to calculate the Program Rating Score for each program were those provided by the Panel of Decision Makers for the Measures selected.

Given the time limitations of the study, and accepting the difficulty of securing the presence of all members of the Panel of Decision Makers for any structured concensus approach, the methodology of weighting the measures was deemed to be satisfactory.

As already noted, the Questionnaire proved inadequate for providing original Panel inputs concerning measures not specified. However, the recommendations already made concerning Measures are intended to provide the necessary revision in this area, and no other changes concerning the Weights system are recommended at this point in the Model's continuing development.

Summary of Recommendations

Viewing the Model as a whole, the following recommendations for revision emerge:

(1) The Program Evaluation section of the Texas State Plan for Vocational Education should be thoroughly revised and much more precisely delineated through evaluator--decision maker structured interface. This applies particularly to the Definition of Evaluation and the Evaluation Criteria.

(2) A systematic methodology should be devised to provide input from the Panel of Decision Makers concerning selection of Measures. This might be accomplished through a structured interview series, or conference, using an evaluator-prepared inventory of available data elements,

but insuring provision for design of new-data collection instruments, as needed.

(3) The present format of existing data collection forms should be reviewed in the light of evaluation data needs with the object of so revising the instruments that the selected data could be obtained without requiring additional forms from the colleges.

Recommendations for Future Research

One contribution of any worthwhile research effort is that other questions arise as a result of the investigation. Accordingly, the following recommendations are offered as areas of needed research:

(1) What are the characteristics of an outstanding vocational and technical education program? The development of a comprehensive and descriptive list of measurable program characteristics, together with instrumentation for uniform data collection, would be of great value to future efforts in this area.

(2) Is it possible to develop an objective vocational and technical education program rating methodology that is noncomparative in nature? A study to develop such a system, operative independently from reference to similar type programs, would be useful to evaluators.

(3) Can self-evaluation by the colleges provide the basis of state-level supervision, with sufficient expertise? The direction of the major national evaluation studies in the field of vocational and technical education have suggested methodologies based on local college self-study (9). Possible formats for such evaluation should be investigated.

(4) Finally, additional theoretical study concerning the relative merits of comparative evaluation versus absolute standards is needed.

In closing, one should note the importance of the quality of the data inputs for any future use of the Comparative Rating Scale Model. The effectualness of the Model's design is completely dependent upon these measures, and the accuracy of these measures is crucial for evaluation effectiveness. This is particularly true of needs assessment studies, but such considerations are vital to all measures selected.

A P P E N D I C E S

A P P E N D I X A

PROGRAM RATING SCORE CALCULATIONS

TABLE 21

PROGRAM RATING SCORE CALCULATIONS

Farm and Ranch Management

College 9

V	RS	Mean	SD	Z	SS	W	WS
1	2,500	22,980	38,130	-0.54	44.6	.073	3.26
2	2,600	21,520	40,933	-0.46	45.4	.108	4.90
3	1,240	145	253	+4.33	93.3	.068	6.34
4	975	107	223	+3.89	88.9	.053	4.71
5	30	34.16	8.48	-0.49	45.1	.073	3.29
6	40	128	101	-0.87	41.3	.081	3.35
7	153,153	50,799	31,636	+3.24	82.4	.051	4.20
8	6,232	9,472	7,874	-0.41	45.9	.063	2.89
9	10	20.61	34.34	-0.31	46.9	.062	2.91
10	4	13.47	35.01	-0.27	47.3	.071	3.36
11	10	23.41	36.77	-0.36	46.4	.096	4.45
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	55.82

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Farm and Ranch Management

College 4

V	RS	Mean	SD	Z	SS	W	WS
1	2,196	22,980	38,130	-0.54	44.6	.073	3.26
2	2,256	21,520	40,933	-0.47	45.3	.108	4.89
3	1,223	145	253	+4.26	92.6	.068	6.30
4	1,000	107	223	+4.00	90.0	.053	4.77
5	30	34.16	8.48	-0.49	45.1	.073	3.29
6	72	128	101	-0.55	44.5	.081	3.60
7	157,944	50,739	31,636	+3.39	83.9	.051	4.28
8	3,788	9,472	7,874	-0.72	42.8	.063	2.70
9	3	20.61	34.34	-0.51	44.9	.062	2.78
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	1	23.41	36.77	-0.61	43.9	.096	4.21
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	55.52

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Farm and Ranch Management

College 14

V	RS	Mean	SD	Z	SS	W	WS
1	3,500	22,980	38,130	-0.51	44.9	.073	3.28
2	15	21,520	40,933	-0.53	44.7	.108	4.83
3	1,235	145	253	+4.31	93.1	.068	6.33
4	1,000	107	223	+4.00	90.0	.053	4.77
5	30	34.16	8.48	-0.49	45.1	.073	3.29
6	66	128	101	-0.61	43.9	.081	3.56
7	160,511	50,799	31,636	+3.47	84.7	.051	4.32
8	2,227	9,472	7,874	-0.92	40.8	.063	2.57
9	2	20.61	34.34	-0.54	44.6	.062	2.77
10	1	13.47	35.01	-0.36	46.4	.071	3.29
11	3	23.41	36.77	-0.56	44.4	.096	4.26
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	55.43

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Farm and Ranch Management

College 20

V	RS	Mean	SD	Z	SS	W	WS
1	2,649	22,980	38,130	-0.53	44.7	.073	3.26
2	1,318	21,520	40,933	-0.49	45.1	.108	4.87
3	1,052	145	253	+3.58	85.8	.068	5.83
4	996	107	223	+3.99	89.9	.053	4.76
5	36	34.16	8.48	+0.22	52.2	.073	3.81
6	72	128	101	-0.55	44.5	.081	3.60
7	121,781	50,799	31,636	+2.24	72.4	.051	3.69
8	4,500	9,472	7,874	-0.63	43.7	.063	2.75
9	20	20.61	34.34	-0.02	49.8	.062	3.09
10	28	13.47	35.01	+0.42	54.2	.071	3.85
11	20	23.41	36.77	-0.09	49.1	.096	4.71
12	7	0.6667	1.4236	+4.45	94.5	.041	3.87
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	56.09

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Associate Degree Nursing

College 1

V	RS	Mean	SD	Z	SS	W	WS
1	37,642	22,980	38,130	+0.38	53.8	.073	3.93
2	38,370	21,520	40,933	+0.41	54.1	.108	5.84
3	753	145	253	+2.40	74.0	.068	5.03
4	950	107	223	+3.78	87.8	.053	4.65
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	129	128	101	-0.01	49.9	.081	4.04
7	105,115	50,799	31,636	+1.72	67.2	.051	3.43
8	20,747	9,472	7,874	+1.43	64.3	.063	4.05
9	35	20.61	34.34	+0.42	54.2	.062	3.36
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	35	23.41	36.77	+0.32	53.2	.096	5.11
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	58.43

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Associate Degree Nursing

College 2

V	RS	Mean	SD	Z	SS	W	WS
1	6,620	22,980	38,130	-0.43	45.7	.073	3.34
2	100	21,520	40,933	-0.52	44.8	.108	4.84
3	1,220	145	253	+4.25	92.5	.068	6.29
4	980	107	223	+3.91	89.1	.053	4.72
5	35	34.16	8.48	+0.10	51.0	.073	3.72
6	73	128	101	-0.54	44.6	.081	3.61
7	116,655	50,799	31,636	+2.08	70.8	.051	3.61
8	11,266	9,472	7,874	+0.23	52.3	.063	3.30
9	22	20.61	34.34	+0.04	50.4	.062	3.13
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	18	23.41	36.77	-0.15	48.5	.096	4.66
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	56.66

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Associate Degree Nursing

College 4

V	RS	Mean	SD	Z	SS	W	WS
1	35,261	22,980	38,130	+0.32	53.2	.073	3.88
2	36,214	21,520	40,933	+0.36	53.4	.108	5.77
3	1,250	145	253	+4.37	93.7	.068	6.37
4	1,000	107	223	+4.00	90.0	.053	4.77
5	32	34.16	8.48	-0.25	47.5	.073	3.47
6	99	128	101	-0.29	47.1	.081	3.82
7	125,908	50,799	31,636	+2.37	73.7	.051	3.76
8	8,278	9,472	7,874	-0.15	48.5	.063	3.06
9	8	20.61	34.34	-0.37	46.3	.062	2.87
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	8	23.41	36.77	-0.42	45.8	.096	4.40
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	57.61

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Associate Degree Nursing

College 6

V	RS	Mean	SD	Z	SS	W	WS
1	130,400	22,980	38,130	+2.82	78.2	.073	5.70
2	137,600	21,520	40,933	+2.84	78.4	.108	8.47
3	1,150	145	253	+3.97	89.7	.068	6.10
4	950	107	223	+3.78	87.8	.053	4.65
5	51	34.16	8.48	+1.99	69.9	.073	5.10
6	317	128	101	+1.87	68.7	.081	5.56
7	0	50,799	31,636	-1.61	33.9	.051	1.73
8	12,329	9,472	7,874	+0.36	46.4	.063	2.92
9	53	20.61	34.34	+0.94	59.4	.062	3.68
10	10	13.47	35.01	-0.10	51.0	.071	3.62
11	47	23.41	36.77	+0.64	56.4	.096	5.41
12	7	0.6667	1.4236	+4.45	94.5	.041	3.87
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	64.81

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Associate Degree Nursing

College 8

V	RS	Mean	SD	Z	SS	W	WS
1	3,264	22,980	38,130	-0.52	44.8	.073	3.27
2	3,365	21,520	40,933	-0.44	45.6	.108	4.92
3	1,150	145	253	+3.97	89.7	.068	6.10
4	1,000	107	223	+4.00	90.0	.053	4.77
5	34	34.16	8.48	-0.02	49.8	.073	3.64
6	105	128	101	-0.23	47.7	.081	3.86
7	88,207	50,799	31,636	+1.18	61.8	.051	3.15
8	13,235	9,472	7,874	+0.48	54.8	.063	3.45
9	34	20.61	34.34	+0.39	53.9	.062	3.34
10	3	13.47	35.01	-0.30	47.0	.071	3.34
11	34	23.41	36.77	+0.29	47.1	.096	4.52
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	56.52

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Associate Degree Nursing

College 10

V	RS	Mean	SD	Z	SS	W	WS
1	1,319	22,980	38,130	-0.57	44.3	.073	3.23
2	207	21.520	40,933	-0.52	44.8	.108	4.83
3	1,230	145	253	+4.29	92.9	.068	6.32
4	813	107	223	+3.17	81.7	.053	4.33
5	34	34.16	8.48	-0.02	49.8	.073	3.64
6	49	128	101	-0.78	42.2	.081	3.42
7	129,359	50,799	31,636	+2.48	74.8	.051	3.81
8	16,649	9,472	7,874	+0.91	59.1	.063	3.72
9	24	20.61	34.34	+0.10	51.0	.062	3.16
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	22	23.41	36.77	-0.04	49.6	.096	4.76
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	56.96

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Associate Degree Nursing

College 11

V	RS	Mean	SD	Z	SS	W	WS
1	518	22,980	38,130	-0.59	44.1	.073	3.22
2	25	21,520	40,933	-0.53	44.7	.108	4.83
3	1,225	145	253	+4.27	92.7	.068	6.30
4	975	107	223	+3.89	88.9	.053	4.71
5	38	34.16	8.48	+0.45	54.5	.073	3.98
6	46	128	101	-0.81	41.9	.081	3.39
7	131,412	50,799	31,636	+2.55	75.5	.051	3.85
8	19,100	9,472	7,874	+1.22	62.2	.063	3.92
9	13	20.61	34.34	-0.22	47.8	.062	2.96
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	13	23.41	36.77	-0.28	47.2	.096	4.53
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	57.13

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Associate Degree Nursing

College 12

V	RS	Mean	SD	Z	SS	W	WS
1	14,220	22,980	38,130	-0.23	47.7	.073	3.48
2	0	21,520	40,933	-0.53	44.7	.108	4.83
3	1,250	145	253	+4.37	93.7	.068	6.37
4	1,000	107	223	+3.83	88.3	.053	4.68
5	86	34.16	8.48	+6.11	111.1	.073	8.11
6	212	128	101	+0.83	58.3	.081	4.72
7	91,351	50,799	31,636	+1.28	62.8	.051	3.20
8	22,862	9,472	7,874	+1.70	67.0	.063	4.22
9	37	20.61	34.34	+0.48	54.8	.062	3.40
10	14	13.47	35.01	+0.02	50.2	.071	3.56
11	32	23.41	36.77	+0.23	52.3	.096	5.02
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	63.75

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Associate Degree Nursing

College 15

V	RS	Mean	SD	Z	SS	W	WS
1	815	22,980	38,130	-0.58	44.2	.073	3.23
2	950	21,520	40,933	-0.50	45.0	.108	4.86
3	1,150	145	253	+3.97	89.7	.068	6.10
4	950	107	223	+3.78	87.8	.053	4.65
5	36	34.16	8.48	+0.22	52.2	.073	3.81
6	61	128	101	-0.66	43.4	.081	3.52
7	71,133	50,799	31,636	+0.64	56.4	.051	2.88
8	29,959	9,472	7,874	+2.60	76.0	.063	4.79
9	27	20.61	34.34	+0.19	51.9	.062	3.22
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	25	23.41	36.77	+0.04	50.4	.096	4.84
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	57.34

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Associate Degree Nursing

College 21

V	RS	Mean	SD	Z	SS	W	WS
1	14,711	22,980	38,130	-0.22	47.8	.073	3.49
2	883	21,520	40,933	-0.50	45.0	.108	4.86
3	1,162	145	253	+4.02	90.2	.068	6.13
4	277	107	223	+0.76	57.6	.053	3.05
5	40	34.16	8.48	+0.69	56.9	.073	4.15
6	206	128	101	+0.77	57.7	.081	4.67
7	60,807	50,799	31,636	+0.32	53.2	.051	2.71
8	9,600	9,472	7,874	+0.02	50.2	.063	3.16
9	44	20.61	34.34	+0.68	56.8	.062	3.52
10	23	13.47	35.01	+0.27	52.7	.071	3.74
11	27	23.41	36.77	+0.10	51.0	.096	4.90
12	7	0.6667	1.4236	+4.45	94.5	.041	3.87
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	56.25

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Associate Degree Nursing

College 24

V	RS	Mean	SD	Z	SS	W	WS
1	1,860	22,980	38,130	-0.55	44.5	.073	3.25
2	60	21,520	40,933	-0.52	44.8	.108	4.84
3	1,250	145	253	+4.37	93.7	.068	6.37
4	1,000	107	223	+4.00	90.0	.053	4.77
5	30	34.16	8.48	-0.49	45.1	.073	3.29
6	144	128	101	+0.16	51.6	.081	4.18
7	94,163	50,799	31,636	+1.37	63.7	.051	3.25
8	19,823	9,472	7,874	+1.31	63.1	.063	3.98
9	16	20.61	34.34	-0.13	48.7	.062	3.02
10	5	13.47	35.01	-0.24	47.6	.071	3.38
11	20	23.41	36.77	-0.09	49.1	.096	4.71
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	57.20

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Interior Design

College 6

V	RS	Mean	SD	Z	SS	W	WS
1	130,400	22,980	38,130	+2.82	78.2	.073	5.71
2	137,600	21,520	40,933	+2.84	78.4	.108	8.47
3	1,150	145	253	+3.97	89.7	.068	6.10
4	950	107	223	+3.78	87.8	.053	4.65
5	31	34.16	8.48	-0.37	46.3	.073	3.38
6	70	128	101	-0.57	44.3	.081	3.59
7	174,421	50,799	31,636	+3.91	89.1	.051	4.54
8	1,644	9,472	7,874	-0.99	40.1	.063	2.53
9	0	20.61	34.34	-0.60	44.0	.062	2.73
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	0	23.41	36.77	-0.64	43.6	.096	4.19
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	61.33

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Interior Design

College 18

V	RS	Mean	SD	Z	SS	W	WS
1	400	22,980	38,130	-0.59	44.1	.073	3.22
2	50	21,520	40,933	-0.52	44.8	.108	4.84
3	1,230	145	253	+4.29	92.9	.068	6.32
4	990	107	223	+3.96	89.6	.053	4.75
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	82	128	101	-0.46	45.4	.081	3.68
7	174,421	50,799	31,636	+3.91	89.1	.051	4.54
8	6,841	9,472	7,874	-0.33	46.7	.063	2.94
9	4	20.61	34.34	-0.48	45.2	.062	2.80
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	3	23.41	36.77	-0.56	44.4	.096	4.26
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	56.34

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Secretarial

College 3

V	RS	Mean	SD	Z	SS	W	WS
1	1,504	22,980	38,130	-0.56	44.4	.073	3.24
2	132	21,520	40,933	-0.52	44.8	.108	4.84
3	1,153	145	253	+3.98	89.8	.068	6.11
4	980	107	223	+3.91	89.1	.053	4.72
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	268	128	101	+1.39	63.9	.081	5.18
7	120,984	50,799	31,636	+2.22	72.2	.051	3.68
8	9,699	9,472	7,874	+0.03	50.3	.063	3.17
9	6	20.61	34.34	-0.43	45.7	.062	2.83
10	2	13.47	35.01	-0.33	46.7	.071	3.32
11	1	23.41	36.77	-0.61	43.9	.096	4.21
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	57.01

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Secretarial

College 4

V	RS	Mean	SD	Z	SS	W	WS
1	35,261	22,980	38,130	+0.32	53.2	.073	3.88
2	36,214	21,520	40,933	+0.36	53.6	.108	5.79
3	1,250	145	253	+4.37	93.7	.068	6.37
4	1,000	107	223	+4.00	90.0	.053	4.77
5	31	34.16	8.48	-0.37	46.3	.073	3.38
6	256	128	101	+1.27	62.7	.081	5.08
7	115,099	50,799	31,636	+2.03	70.3	.051	3.59
8	6,888	9,472	7,874	-0.33	46.7	.063	2.94
9	229	20.61	34.34	+6.07	110.7	.062	6.86
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	217	23.41	36.77	+5.26	102.6	.096	9.85
12	4	0.6667	1.4236	+2.34	73.4	.041	3.01
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	66.80

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Secretarial

College 6

V	RS	Mean	SD	Z	SS	W	WS
1	177,700	22,980	38,130	+4.06	90.6	.073	6.61
2	185,700	21,520	40,933	+4.01	90.1	.108	9.73
3	0	145	253	-0.57	44.3	.068	3.01
4	0	107	223	-0.48	45.2	.053	2.40
5	36	34.16	8.48	+0.22	52.2	.073	3.81
6	535	128	101	+4.03	90.3	.081	7.31
7	98,198	50,799	31,636	+1.50	65.0	.051	3.32
8	10,718	9,472	7,874	+0.16	51.6	.063	3.25
9	6	20.61	34.34	-0.43	45.7	.062	2.83
10	3	13.47	35.01	-0.30	47.0	.071	3.34
11	5	23.41	36.77	-0.50	45.0	.096	4.32
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	62.09

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Secretarial

College 9

V	RS	Mean	SD	Z	SS	W	WS
1	294	22,980	38,130	-0.59	44.1	.073	3.22
2	302	21,520	40,933	-0.52	44.8	.108	4.84
3	1,230	145	253	+4.29	92.9	.068	6.32
4	995	107	223	+3.98	89.8	.053	4.76
5	31	34.16	8.48	-0.37	46.3	.073	3.38
6	145	128	101	+0.17	51.7	.081	4.19
7	151,969	50,799	31,636	+3.20	82.0	.051	4.18
8	7,724	9,472	7,874	-0.22	47.8	.063	3.01
9	6	20.61	34.34	-0.43	45.7	.062	2.83
10	13	13.47	35.01	-0.01	49.9	.071	3.54
11	7	23.41	36.77	-0.45	45.5	.096	4.37
12	6	0.6667	1.4236	+3.75	87.5	.041	3.58
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	56.22

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Secretarial

College 12

V	RS	Mean	SD	Z	SS	W	WS
1	14,220	22,980	38,130	-0.23	47.7	.073	3.48
2	0	21,520	40,933	-0.53	44.7	.108	4.83
3	1,250	145	253	+4.37	93.7	.068	6.37
4	1,000	107	223	+4.00	90.0	.053	4.77
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	122	128	101	-0.06	49.4	.081	4.00
7	121,323	50,799	31,636	+2.23	77.3	.051	3.94
8	26,028	9,472	7,874	+2.10	71.0	.063	4.47
9	17	20.61	34.34	-0.11	48.9	.062	3.03
10	3	13.47	35.01	-0.30	47.0	.071	3.34
11	10	23.41	36.77	-0.36	46.4	.096	4.45
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	58.39

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Secretarial

College 19

V	RS	Mean	SD	Z	SS	W	WS
1	300	22,980	38,130	-0.59	44.1	.073	3.22
2	40	21,520	40,933	-0.52	44.8	.108	4.84
3	1,189	145	253	+4.13	91.3	.068	6.21
4	1,000	107	223	+4.00	90.0	.053	4.77
5	31	34.16	8.48	-0.37	46.3	.073	3.38
6	74	128	101	-0.53	44.7	.081	3.62
7	133,191	50,799	31,636	+2.60	76.0	.051	3.88
8	6,075	9,472	7,874	-0.43	45.7	.063	2.88
9	52	20.61	34.34	+0.91	59.1	.062	3.66
10	36	13.47	35.01	+0.64	56.4	.071	4.00
11	44	23.41	36.77	+0.56	55.6	.096	5.34
12	0	0.6667	1.4236	-0.47	45.3	.041	1.86
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	55.66

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Secretarial

College 21

V	RS	Mean	SD	Z	SS	W	WS
1	6,428	22,980	38,130	-0.43	45.7	.073	3.34
2	411	21,520	40,933	-0.52	44.8	.108	4.84
3	1,125	145	253	+3.87	88.7	.068	6.03
4	800	107	223	+3.11	81.1	.053	4.30
5	35	34.16	8.48	+0.10	51.0	.073	3.72
6	274	128	101	+1.45	64.5	.081	5.22
7	96,212	50,799	31,636	+1.44	64.4	.051	3.28
8	3,600	9,472	7,874	-0.75	42.5	.063	2.68
9	20	20.61	34.34	-0.02	49.8	.062	3.09
10	107	13.47	35.01	+2.67	76.7	.071	5.45
11	84	23.41	36.77	+1.65	66.5	.096	6.38
12	6	0.6667	1.4236	+3.75	87.5	.041	3.59
13-16	1	1	0	0	50.0	.160	8.00

Program Rating Score 59.92

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Secretarial

College 22

V	RS	Mean	SD	Z	SS	W	WS
1	6,428	22,980	38,130	-0.43	45.7	.073	3.34
2	411	21,520	40,933	-0.52	44.8	.108	4.84
3	1,125	145	253	+3.87	88.7	.068	6.03
4	800	107	223	+3.11	81.1	.053	4.30
5	30	34.16	8.48	-0.49	45.1	.073	3.29
6	167	128	101	+0.39	53.9	.081	4.37
7	96,212	50,799	31,636	+1.44	64.4	.051	3.28
8	3,600	9,472	7,874	-0.75	42.5	.063	2.68
9	9	20.61	34.34	-0.34	46.6	.062	2.89
10	70	13.47	35.01	+1.61	66.1	.071	4.69
11	44	23.41	36.77	+0.56	55.6	.096	5.34
12	6	0.6667	1.4236	+3.75	87.5	.041	3.59
13-16	1	1	0	0	50.0	.160	8.00

Program Rating Score 56.64

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Mid-Management

College 1

V	RS	Mean	SD	Z	SS	W	WS
1	37,000	22,980	38,130	-0.51	44.9	.073	3.28
2	37,370	21,520	40,933	+0.39	53.9	.108	5.82
3	819	145	253	+2.66	76.6	.068	5.21
4	985	107	223	+3.94	89.4	.053	4.74
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	48	128	101	-0.79	42.1	.081	3.41
7	126,179	50,799	31,636	+2.38	73.8	.051	3.76
8	4,577	9,472	7,874	-0.62	43.8	.063	2.76
9	7	20.61	34.34	-0.40	46.0	.062	2.85
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	7	23.41	36.77	-0.45	45.5	.096	4.36
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	55.18

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Mid-Management

College 5

V	RS	Mean	SD	Z	SS	W	WS
1	78,900	22,980	38,130	+1.47	64.7	.073	4.72
2	82,400	21,520	40,933	+1.49	64.9	.108	7.01
3	1,100	145	253	+3.77	87.7	.068	5.96
4	950	107	223	+3.78	87.8	.053	4.65
5	32	34.16	8.48	-0.25	47.5	.073	3.47
6	143	128	101	+0.15	51.5	.081	4.17
7	125,602	50,799	31,636	+2.36	73.6	.051	3.75
8	3,135	9,472	7,874	-0.80	42.0	.063	2.65
9	3	20.61	34.34	-0.51	44.9	.062	2.78
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	1	23.41	36.77	-0.61	43.9	.096	4.21
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	58.81

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Mid-Management

College 6

V	RS	Mean	SD	Z	SS	W	WS
1	78,900	22,980	38,130	+1.47	64.7	.073	4.72
2	82,400	21,520	40,933	+1.49	64.9	.108	7.01
3	1,100	145	253	+3.77	87.7	.068	5.96
4	950	107	223	+3.78	87.8	.053	4.65
5	31	34.16	8.48	-0.37	46.3	.073	3.38
6	173	128	101	+0.44	54.4	.081	4.41
7	107,512	50,799	31,636	+1.79	67.9	.051	3.46
8	5,054	9,472	7,874	-0.56	44.4	.063	2.80
9	19	20.61	34.34	-0.05	49.5	.062	3.07
10	8	13.47	35.01	-0.16	48.4	.071	3.44
11	12	23.41	36.77	-0.31	46.9	.096	4.50
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	59.56

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Mid-Management

College 7

V	RS	Mean	SD	Z	SS	W	WS
1	78,900	22,980	38,130	+1.47	64.7	.073	4.72
2	82,400	21,520	40,933	+1.49	64.9	.108	7.01
3	1,100	145	253	+3.77	87.7	.068	5.96
4	950	107	223	+3.78	87.8	.053	4.65
5	30	34.16	8.48	-0.49	45.1	.073	3.29
6	61	128	101	-0.66	43.4	.081	3.52
7	144,970	50,799	31,636	+2.98	79.8	.051	4.07
8	2,806	9,472	7,874	-0.85	41.5	.063	2.61
9	0	20.61	34.34	-0.60	44.0	.062	2.73
10	4	13.47	35.01	-0.27	47.3	.071	3.36
11	4	23.41	36.77	-0.53	44.7	.096	4.29
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	58.37

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Mid-Management

College 10

V	RS	Mean	SD	Z	SS	W	WS
1	5,864	22,980	38,130	-0.45	45.5	.073	3.32
2	655	21,520	40,933	-0.51	44.9	.108	4.85
3	1,147	145	253	+3.96	89.6	.068	6.09
4	448	107	223	+1.53	65.3	.053	3.46
5	31	34.16	8.48	-0.37	46.3	.073	3.38
6	56	128	101	-0.71	42.9	.081	3.47
7	136,432	50,799	31,636	+2.71	77.1	.051	3.93
8	3,655	9,472	7,874	-0.74	42.6	.063	2.68
9	12	20.61	34.34	-0.25	47.5	.062	2.94
10	2	13.47	35.01	-0.33	46.7	.071	3.32
11	8	23.41	36.77	-0.42	45.8	.096	4.40
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	54.00

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Mid-Management

College 12

V	RS	Mean	SD	Z	SS	W	WS
1	14,220	22,980	38,130	-0.23	47.7	.073	3.48
2	0	21,520	40,933	-0.53	44.7	.108	4.82
3	1,250	145	253	+4.37	93.7	.068	6.37
4	1,000	107	223	+4.00	90.0	.053	4.77
5	20	34.16	8.48	-1.67	33.3	.073	2.43
6	90	128	101	-0.38	46.2	.081	3.74
7	145,381	50,799	31,636	+2.99	79.9	.051	4.07
8	8,132	9,472	7,874	-0.17	48.3	.063	3.04
9	62	20.61	34.34	+1.21	62.1	.062	3.85
10	16	13.47	35.01	+0.07	50.7	.071	3.60
11	70	23.41	36.77	+1.27	62.7	.096	6.02
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	58.35

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Mid-Management

College 14

V	RS	Mean	SD	Z	SS	W	WS
1	480	22,980	38,130	-0.59	44.1	.073	3.22
2	15	21,520	40,933	-0.52	44.8	.108	4.84
3	1,238	145	253	+4.32	93.2	.068	6.34
4	997	107	223	+3.99	89.9	.053	4.76
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	119	128	101	-0.09	49.1	.081	3.98
7	142,546	50,799	31,636	+2.90	79.0	.051	4.03
8	2,080	9,472	7,874	-0.94	40.6	.063	2.56
9	1	20.61	34.34	-0.57	44.3	.062	2.75
10	10	13.47	35.01	-0.10	49.0	.071	3.48
11	9	23.41	36.77	-0.39	46.1	.096	4.43
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	56.10

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Mid-Management

College 15

V	RS	Mean	SD	Z	SS	W	WS
1	2,480	22,980	38,130	-0.54	44.6	.073	3.26
2	3,480	21,520	40,933	-0.44	45.6	.108	4.92
3	1,130	145	253	+3.89	88.9	.068	6.05
4	950	107	223	+3.78	87.8	.053	4.65
5	29	34.16	8.48	-0.61	43.9	.073	3.20
6	139	128	101	+0.11	48.9	.081	3.96
7	129,835	50,799	31,636	+2.50	75.0	.051	3.82
8	8,870	9,472	7,874	-0.08	49.2	.063	3.10
9	7	20.61	34.34	-0.40	46.0	.062	2.85
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	5	23.41	36.77	-0.50	45.0	.096	4.32
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	55.57

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Mid-Management

College 23

V	RS	Mean	SD	Z	SS	W	WS
1	1,759	22,980	38,130	-0.56	44.4	.073	3.24
2	175	21,520	40,933	-0.52	44.8	.108	4.84
3	1,217	145	253	+4.24	92.4	.068	6.28
4	933	107	223	+3.70	87.0	.053	4.61
5	30	34.16	8.48	-0.49	45.1	.073	3.29
6	77	128	101	-0.50	45.0	.081	3.64
7	149,204	50,799	31,636	+3.11	81.1	.051	4.14
8	4,391	9,472	7,874	-0.64	43.6	.063	2.75
9	8	20.61	34.34	-0.37	46.3	.062	2.87
10	6	13.47	35.01	-0.21	47.9	.071	3.40
11	1	23.41	36.77	-0.61	49.4	.096	4.74
12	7	0.6667	1.4236	+4.45	94.5	.041	3.87
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	55.67

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Electronics Technology

College 1

V	RS	Mean	SD	Z	SS	W	WS
1	16,050	22,980	38,130	-0.18	48.2	.073	3.52
2	16,050	21,520	40,933	-0.13	48.7	.108	5.26
3	1,183	145	253	+4.10	91.0	.068	6.19
4	1,000	107	223	+4.00	90.0	.053	4.77
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	72	128	101	-0.55	44.5	.081	3.60
7	126,179	50,799	31,636	+2.38	73.8	.051	3.76
8	9,183	9,472	7,874	-0.04	49.6	.063	3.12
9	12	20.61	34.34	-0.25	47.5	.062	2.94
10	8	13.47	35.01	-0.16	48.4	.071	3.44
11	17	23.41	36.77	-0.17	48.3	.096	4.64
12	6	0.6667	1.4236	+3.75	87.5	.041	3.59
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	56.38

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Electronics Technology

College 5

V	RS	Mean	SD	Z	SS	W	WS
1	57,100	22,980	38,130	+0.89	58.9	.073	4.30
2	58,200	21,520	40,933	+0.90	59.0	.108	6.37
3	1,100	145	253	+3.77	87.7	.068	5.96
4	950	107	223	+3.78	87.8	.053	4.65
5	35	34.16	8.48	+0.10	51.0	.073	3.72
6	176	128	101	+0.48	54.8	.081	4.44
7	137,777	50,799	31,636	+2.75	77.5	.051	3.95
8	1,782	9,472	7,874	-0.98	40.2	.063	2.53
9	0	20.61	34.34	-0.60	44.0	.062	2.73
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	0	23.41	36.77	-0.64	43.6	.096	4.19
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	58.28

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Electronics Technology

College 13

V	RS	Mean	SD	Z	SS	W	WS
1	10,100	22,980	38,130	-0.34	46.6	.073	3.40
2	10,100	21,520	40,933	-0.28	47.2	.108	5.10
3	1,242	145	253	+4.34	93.4	.068	6.35
4	1,000	107	223	+4.00	90.0	.053	4.77
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	67	128	101	-0.60	44.0	.081	3.56
7	149,402	50,799	31,636	+3.12	81.2	.051	4.14
8	6,550	9,472	7,874	-0.37	46.3	.063	2.92
9	7	20.61	34.34	-0.40	46.0	.062	2.85
10	4	13.47	35.01	-0.27	47.3	.071	3.36
11	6	23.41	36.77	-0.47	45.3	.096	4.35
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	56.51

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Electronics Technology

College 15

V	RS	Mean	SD	Z	SS	W	WS
1	7,900	22,980	38,130	-0.40	46.0	.073	3.36
2	8,500	21,520	40,933	-0.32	46.8	.108	5.05
3	950	145	253	+3.18	81.8	.068	5.56
4	950	107	223	+3.78	87.8	.053	4.65
5	31	34.16	8.48	-0.37	46.3	.073	3.38
6	105	128	101	-0.23	47.7	.081	3.86
7	166,966	50,799	31,636	+3.67	86.7	.051	4.42
8	38,861	9,472	7,874	+3.73	87.3	.063	5.50
9	6	20.61	34.34	-0.43	45.7	.062	2.83
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	4	23.41	36.77	-0.53	44.7	.096	4.29
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	58.34

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Electronics Technology

College 16

V	RS	Mean	SD	Z	SS	W	WS
1	14,700	22,980	38,130	-0.22	47.8	.073	3.49
2	15,066	21,520	40,933	-0.16	48.4	.108	5.23
3	340	145	253	+0.77	57.7	.068	3.92
4	280	107	223	+0.78	57.8	.053	3.06
5	34	34.16	8.48	-0.02	49.8	.073	3.64
6	169	128	101	+0.41	45.9	.081	3.72
7	85,916	50,799	31,636	+1.11	61.1	.051	3.12
8	15,681	9,472	7,874	+0.79	57.9	.063	3.65
9	10	20.61	34.34	-0.31	46.9	.062	2.91
10	4	13.47	35.01	-0.27	47.3	.071	3.36
11	12	23.41	36.77	-0.31	46.9	.096	4.50
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	52.76

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Electronics Technology

College 17

V	RS	Mean	SD	Z	SS	W	WS
1	14,700	22,980	38,130	-0.22	47.8	.073	3.49
2	15,066	21,520	40,933	-0.16	48.4	.108	5.23
3	340	145	253	+0.77	57.7	.068	3.92
4	280	107	223	+0.78	57.8	.053	3.06
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	112	128	101	-0.16	48.4	.081	3.92
7	135,628	50,799	31,636	+2.68	76.8	.051	3.92
8	15,681	9,472	7,874	+0.79	57.9	.063	3.65
9	3	20.61	34.34	-0.51	54.9	.062	3.40
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	1	23.41	36.77	-0.61	43.9	.096	4.21
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	53.79

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Electronics Technology

College 18

V	RS	Mean	SD	Z	SS	W	WS
1	900	22,980	38,130	-0.58	44.2	.073	3.23
2	40	21,520	40,933	-0.52	44.8	.108	4.84
3	1,220	145	253	+4.25	92.5	.068	6.29
4	1,000	107	223	+4.00	90.0	.053	4.77
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	442	128	101	+3.11	81.1	.081	6.57
7	81,209	50,799	31,636	+0.96	59.6	.051	3.04
8	13,423	9,472	7,874	+0.50	55.0	.063	3.47
9	26	20.61	34.34	+0.16	51.6	.062	3.39
10	217	13.47	35.01	+5.81	108.1	.071	7.68
11	131	23.41	36.77	+2.93	79.3	.096	7.61
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	66.60

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Electronics Technology

College 21

V	RS	Mean	SD	Z	SS	W	WS
1	15,000	22,980	38,130	-0.21	47.9	.073	3.50
2	400	21,520	40,933	-0.52	44.8	.108	4.84
3	1,197	145	253	+4.16	91.6	.068	6.23
4	750	107	223	+2.88	78.8	.053	4.18
5	42	34.16	8.48	+0.92	59.2	.073	4.32
6	199	128	101	+0.70	57.0	.081	4.62
7	101,301	50,799	31,636	+1.60	66.0	.051	3.37
8	5,105	9,472	7,874	-0.55	44.5	.063	2.80
9	9	20.61	34.34	-0.34	46.6	.062	2.89
10	56	13.47	35.01	+1.21	62.1	.071	4.41
11	36	23.41	36.77	+0.34	53.4	.096	5.13
12	5	0.6667	1.4236	+3.04	80.4	.041	3.30
13-16	1	1	0.	0	50.0	.160	8.00
						Program Rating Score	57.59

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Electronics Technology

College 26

V	RS	Mean	SD	Z	SS	W	WS
1	915	22,980	38,130	-0.58	44.2	.073	3.23
2	85	21,520	40,933	-0.52	44.8	.108	4.84
3	1,215	145	253	+4.23	92.3	.068	6.28
4	1,000	107	223	+4.00	90.0	.053	4.77
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	134	128	101	+0.06	50.6	.081	4.10
7	110,188	50,799	31,636	+1.88	68.8	.051	3.51
8	4,726	9,472	7,874	-0.60	49.4	.063	3.11
9	82	20.61	34.34	+1.79	67.9	.062	4.21
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	52	23.41	36.77	+0.78	57.8	.096	5.55
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	58.59

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Electronics Technology

College 27

V	RS	Mean	SD	Z	SS	W	WS
1	2,117	22,980	38,130	-0.55	44.5	.073	3.25
2	54	21,520	40,933	-0.52		.108	4.84
3	1,230	145	253	+4.29	92.9	.068	6.32
4	966	107	223	+3.85	88.5	.053	4.69
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	55	128	101	-0.72	42.8	.081	3.47
7	147,654	50,799	31,636	+3.06	80.6	.051	4.11
8	5,909	9,472	7,874	-0.45	45.5	.063	2.87
9	7	20.61	34.34	-0.40	46.0	.062	2.85
10	2	13.47	35.01	-0.33	46.7	.071	3.32
11	4	23.41	36.77	-0.53	44.7	.096	4.29
12	7	0.6667	1.4236	+4.45	94.5	.041	3.87
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	55.43

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Automobile Mechanics

College 1

V	RS	Mean	SD	Z	SS	W	WS
1	37,642	22,980	38,130	+0.38	53.8	.073	3.93
2	38,370	21,520	40,933	+0.41	54.1	.108	5.84
3	753	145	253	+2.40	74.0	.068	5.03
4	950	107	223	+3 78	87.8	.053	4.65
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	26	128	101	-1.01	39.9	.081	3,23
7	105,149	50,799	31,636	+1.72	67.2	.051	3.43
8	15,164	9,472	7,874	+0.72	57.2	.063	3.60
9	16	20.61	34.34	-0.13	48.7	.062	3.02
10	13	13.47	35.01	-0.01	49.9	.071	3.54
11	29	23.41	36.77	+0.15	51.5	.096	4.94
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	56.92

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Automobile Mechanics

College 5

V	RS	Mean	SD	Z	SS	W	WS
1	57,100	22,980	38,130	+0.89	58.9	.073	4.30
2	58,200	21,520	40,933	+0.90	59.0	.108	6.37
3	1,100	145	253	+3.77	87.7	.068	5.96
4	950	107	223	+3.78	87.8	.053	4.65
5	37	34.16	8.48	+0.33	53.3	.073	3.89
6	118	128	101	-0.10	49.0	.081	3.97
7	145,796	50,799	31,636	+3.00	53.0	.051	2.70
8	3,597	9,472	7,874	-0.75	42.5	.063	2.68
9	11	20.61	34.34	-0.28	47.2	.062	2.93
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	11	23.41	36.77	-0.34	46.6	.096	4.47
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	57.36

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Automobile Mechanics

College 8

V	RS	Mean	SD	Z	SS	W	WS
1	3,261	22,980	38,130	-0.52	44.8	.073	3.27
2	3,350	21,520	40,933	-0.44	45.6	.108	4.92
3	1,250	145	253	+4.37	93.7	.068	6.37
4	1,000	107	223	+4.00	90.0	.053	4.77
5	34	34.16	8.48	-0.02	49.8	.073	3.64
6	45	128	101	-0.82	41.8	.081	3.39
7	151,264	50,799	31,636	+3.18	81.8	.051	4.17
8	2,450	9,472	7,874	-0.89	41.1	.063	2.59
9	11	20.61	34.34	-0.28	47.2	.062	2.93
10	6	13.47	35.01	-0.21	47.9	.071	3.40
11	16	23.41	36.77	-0.20	48.0	.096	4.61
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	56.22

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Automobile Mechanics

College 20

V	RS	Mean	SD	Z	SS	W	WS
1	243	22,980	38,130	-0.60	44.0	.073	3.21
2	151	21,520	40,933	-0.52	44.8	.108	4.84
3	1,235	145	253	+4.31	93.1	.068	6.33
4	1,000	107	223	+4.00	90.0	.053	4.77
5	37	34.16	8.48	+0.33	53.3	.073	3.89
6	55	128	101	-0.72	42.8	.081	3.47
7	140,432	50,799	31,636	+2.83	78.3	.051	3.99
8	4,500	9,472	7,874	-0.63	43.7	.063	2.75
9	10	20.61	34.34	-0.31	46.9	.062	2.91
10	2	13.47	35.01	-0.33	46.7	.071	3.32
11	10	23.41	36.77	-0.36	46.4	.096	4.45
12	7	0.6667	1.4236	+4.45	94.5	.041	3.87
13-16	1	1	0	0	50.0	.160	8.00

Program Rating Score 55.80

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Automobile Mechanics

College 21

V	RS	Mean	SD	Z	SS	W	WS
1	3,225	22,980	38,130	-0.52	44.8	.073	3.27
2	140	21,520	40,933	-0.52	44.8	.108	4.84
3	1,200	145	253	+4.17	91.7	.068	6.24
4	940	107	223	+3.74	87.4	.053	4.63
5	33	34.16	8.48	-0.14	48.6	.073	3.55
6	68	128	101	-0.59	44.1	.081	3.57
7	139,969	50,799	31,636	+2.82	78.2	.051	3.99
8	2,040	9,472	7,874	-0.94	40.6	.063	2.56
9	0	20.61	34.34	-0.60	44.0	.062	2.73
10	0	13.47	35.01	-0.38	46.2	.071	3.28
11	0	23.41	36.77	-0.64	43.6	.096	4.19
12	8	0.6667	1.4236	+5.15	101.5	.041	4.16
13-16	1	1	0	0	50.0	.160	8.00

Program Rating Score 55.01

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Automobile Mechanics

College 25

V	RS	Mean	SD	Z	SS	W	WS
1	0	22,980	38,130	-0.60	44.0	.073	3.21
2	0	21,520	40,933	-0.53	44.7	.108	4.83
3	1,236	145	253	+4.31	93.1	.068	6.33
4	1,000	107	223	+4.00	90.0	.053	4.77
5	29	34.16	8.48	-0.61	43.9	.073	3.20
6	54	128	101	-0.73	42.7	.081	3.46
7	133,007	50,799	31,636	+2.60	76.0	.051	3.88
8	6,600	9,472	7,874	-0.36	46.4	.063	2.92
9	15	20.61	34.34	-0.16	48.4	.062	3.00
10	5	13.47	35.01	-0.24	47.6	.071	3.38
11	10	23.41	36.77	-0.36	46.4	.096	4.45
12	6	0.6667	1.4236	+3.75	87.5	.041	3.59
13-16	1	1	0	0	50.0	.160	8.00

Program Rating Score 55.02

Mean of Program Rating Scores = 50

Standard Deviation = 10

TABLE 21 (continued)

PROGRAM RATING SCORE

Automobile Mechanics

College 27

V	RS	Mean	SD	Z	SS	W	WS
1	2,117	22,980	38,130	-0.55	44.5	.073	3.25
2	54	21,520	40,933	-0.52	44.8	.108	4.84
3	1,230	145	253	+4.29	92.9	.068	6.32
4	966	107	223	+3.85	88.5	.053	4.69
5	31	34.16	8.48	-0.37	46.3	.073	3.38
6	36	128	101	-0.91	40.9	.081	3.31
7	149,710	50,799	31,636	+3.13	81.3	.051	4.15
8	5,701	9,472	7,874	-0.48	45.2	.063	2.85
9	10	20.61	34.34	-0.31	46.9	.062	2.91
10	2	13.47	35.01	-0.33	46.7	.071	3.32
11	8	23.41	36.77	-0.42	45.8	.096	4.40
12	5	0.6667	1.4236	+3.04	80.4	.041	3.30
13-16	1	1	0	0	50.0	.160	8.00
						Program Rating Score	54.72

Mean of Program Rating Scores = 50

Standard Deviation = 10

A P P E N D I X B

STATISTICAL SUMMARY

TABLE 22

Statistical Summary

VARIABLE 1

22980.0588 = MEAN.
37753.9329 = SIGMA.
5286.6080 = SIGMA OF MEAN.
38129.6031 = STANDARD DEVIATION.
5339.2124 = STANDARD ERROR OF MEAN.
1171983.0000 = SUM OF SCORES.
*625570009.0000 = SUM OF SQUARES.
6.9421 = SKEWNESS Z, (P = .0000).
7.9662 = KURTOSIS Z, (P = .0000).

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD	NORMAL
327.6991	17	33	17	44	40
4103.0924	8	16	41	45	48
7878.4857	4	8	53	46	51
11653.8790	1	2	58	47	52
15429.2723	8	16	67	48	54
34306.2387	2	4	76	53	57
38081.6320	3	6	81	54	59
56958.5984	2	4	86	59	61
79610.9581	3	6	91	65	64
128691.0708	2	4	96	78	68
177771.1835	1	2	99	91	73

TABLE 22 (cont.)

VARIABLE 2

21520.4706 = MEAN.
40530.0629 = SIGMA.
5675.3440 = SIGMA OF MEAN.
40933.3570 = STANDARD DEVIATION.
5731.8165 = STANDARD ERROR OF MEAN.
1097544.0000 = SUM OF SCORES.
*396649280.0000 = SUM OF SQUARES.
6.9059 = SKEWNESS Z, (P = .0000).
7.7153 = KURTOSIS Z, (P = .0000).

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD	NORMAL
1255.4391	30	59	29	45	45
5308.4454	3	6	62	46	53
9361.4517	2	4	67	47	54
13414.4580	2	4	71	48	55
17467.4643	1	2	74	49	56
37732.4957	5	10	79	54	58
57997.5272	2	4	86	59	61
82315.5649	3	6	91	65	64
139057.6530	2	4	96	79	68
187693.7285	1	2	99	91	73

TABLE 22 (cont.)

VARIABLE 3

144.8235 = MEAN.
250.7193 = SIGMA.
35.1077 = SIGMA OF MEAN.
253.2141 = STANDARD DEVIATION.
35.4571 = STANDARD ERROR OF MEAN.
7386.0000 = SUM OF SCORES.
4275536.0000 = SUM OF SQUARES.
8.3538 = SKEWNESS Z, (P = .0000).
11.7072 = KURTOSIS Z, (P = .0000).

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD	NORMAL
-5.6081	7	14	7	44	35
19.4639	15	29	28	45	44
44.5358	4	8	47	46	49
69.6077	2	4	53	47	51
94.6797	7	14	62	48	53
119.7516	3	6	72	49	56
144.8235	5	10	79	50	58
194.9674	1	2	85	52	60
295.2551	1	2	87	56	61
420.6148	1	2	89	61	62
495.8306	2	4	92	64	64
922.0535	2	4	96	81	68
1247.9886	1	2	99	94	73

TABLE 22 (cont.)

VARIABLE 4

107.3333 = MEAN.
221.2702 = SIGMA.
30.9840 = SIGMA OF MEAN.
223.4719 = STANDARD DEVIATION
31.2923 = STANDARD ERROR OF MEAN.
5474.0000 = SUM OF SCORES.
3084528.0000 = SUM OF SQUARES.
7.7350 = SKEWNESS Z, (P = .0000).
8.7825 = KURTOSIS Z, (P = .0000).

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD	NORMAL
-3.3018	20	39	20	45	41
18.8253	6	12	45	46	49
40.9523	14	27	65	47	54
63.0793	2	4	80	48	59
195.8414	3	6	85	54	60
240.0954	1	2	89	56	62
549.8737	1	2	91	70	64
726.8899	3	6	95	78	67
992.4141	1	2	99	90	73

TABLE 22 (cont.)

VARIABLE 5

34.1569 = MEAN.
8.3932 = SIGMA.
1.1753 = SIGMA OF MEAN.
8.4767 = STANDARD DEVIATION.
1.1870 = STANDARD ERROR OF MEAN.
1742.0000 = SUM OF SCORES.
63094.0000 = SUM C. SQUARES.
13.6339 = SKEWNESS Z, (P = .0000).
37.9841 = KURTOSIS Z, (P = .0000).

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD	NORMAL
20.0000	1	2	1	33	27
29.0000	2	4	4	44	32
30.0000	7	14	13	45	39
31.0000	8	16	27	46	44
32.0000	2	4	37	47	47
33.0000	14	27	53	49	51
34.0000	4	8	71	50	55
35.0000	3	6	77	51	58
36.0000	3	6	83	52	60
37.0000	2	4	88	53	62
38.0000	1	2	91	55	64
40.0000	1	2	93	57	65
42.0000	1	2	95	59	67
51.0000	1	2	97	70	69
86.0000	1	2	99	112	73

TABLE 22 (cont.)

VARIABLE 6

127.9020 = MEAN.
99.5557 = SIGMA.
13.9406 = SIGMA OF MEAN.
100.5464 = STANDARD DEVIATION.
14.0793 = STANDARD ERROR OF MEAN.
6523.0000 = SUM OF SCORES.
1339783.0000 = SUM OF SQUARES.
6.1484 = SKEWNESS Z, (P = .0000).
7.379 = KURTOSIS Z, (P = .0000).

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD	NORMAL
28.3462	1	2	1	40	27
38.3018	2	4	4	41	32
48.2574	4	8	10	42	37
58.2129	6	12	20	43	41
68.1685	8	16	33	44	46
78.1241	3	6	44	45	49
88.0797	1	2	48	46	50
98.0352	1	2	50	47	50
107.9908	3	6	54	48	51
117.9464	3	6	60	49	52
127.9020	1	2	64	50	54
137.8575	2	4	67	51	54
147.8131	3	6	72	52	56
167.7243	2	4	76	54	57
177.6798	2	4	80	55	59
197.5910	1	2	83	57	60
207.5465	2	4	86	58	61
257.3244	1	2	89	63	62
267.2800	1	2	91	64	64
277.2356	1	2	93	65	65
317.0578	1	2	95	69	67
446.4803	1	2	97	82	69
536.0805	1	2	99	91	73

TABLE 22 (cont.)

VARIABLE 7

50798.7059 = MEAN.
31324.3691 = SIGMA.
4386.2890 = SIGMA OF MEAN.
31636.0620 = STANDARD DEVIATION.
4429.9348 = STANDARD ERROR OF MEAN.
2590734.0000 = SUM OF SCORES.
*647955452.0000 = SUM OI SQUARES.
3.6802 = SKEWNESS Z, (P = .0005).
4.3053 = KURTOSIS Z, (P = .0001).

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTIIE	STANDARD	NORMAL
679.7154	2	4	2	34	29
6944.5892	1	2	5	36	33
13209.4630	1	2	7	38	35
16341.8999	1	2	9	39	36
22606.7737	3	6	13	41	39
25739.2106	4	8	20	42	41
28871.6475	3	6	26	43	44
32004.0844	1	2	30	44	45
35136.5213	3	6	34	45	46
38268.9583	2	4	39	46	47
41401.3952	2	4	43	47	48
44533.8321	3	6	48	48	50
47666.2690	4	8	55	49	51
53931.1428	3	6	62	51	53
57063.5797	1	2	66	52	54
60196.0166	1	2	68	53	55
63328.4535	1	2	70	54	55
66460.8904	1	2	72	55	56
69593.3273	2	4	75	56	57
72725.7642	1	2	77	57	58
75858.2011	1	2	79	58	58
78990.6380	3	6	83	59	60
82123.0749	1	2	87	60	61
85255.5119	1	2	89	61	62
88387.9488	1	2	91	62	64
94652.8226	1	2	93	64	65
104050.1333	1	2	95	67	67
113447.4440	1	2	97	70	69
172963.7452	1	2	99	89	73

TABIE 22 (cont.)

VARIABIE 8

9471.8431 = MEAN.
7796.7881 = SIGMA.
1091.7687 = SIGMA OF MEAN.
7874.3699 = STANDARD DEVIATION.
1102.6323 = STANDARD ERROR OF MEAN.
483064.0000 = SUM OF SCORES.
675791536.0000 = SKEWNESS Z, (P = .0000).
4.1759 = KURTOSIS Z, (P = .0001).

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD	NORMAL
1675.0551	3	6	3	40	31
2454.7339	4	8	10	41	37
3234.4127	4	8	18	42	41
4014.0915	3	6	25	43	43
4793.7703	6	12	33	44	46
5573.4491	2	4	41	45	48
6353.1279	4	8	47	46	49
7132.8067	2	4	53	47	51
7912.4855	3	6	58	48	52
8692.1643	1	2	62	49	53
9471.8431	3	6	66	50	54
11031.2007	2	4	71	52	55
12590.5584	1	2	74	54	56
13370.2372	2	4	76	55	57
14929.5948	1	2	79	57	58
15709.2736	2	4	82	58	59
16488.9524	1	2	85	59	60
18827.9888	1	2	87	62	61
19607.6676	1	2	89	63	62
20387.3464	1	2	91	64	64
22726.3828	1	2	93	67	65
25845.0981	1	2	95	71	67
29743.4921	1	2	97	76	69
39099.6377	1	2	99	88	73

TABLE 22 (cont.)

VARIABLE 9

20.6078 = MEAN.
34.0064 = SIGMA.
4.7618 = SIGMA OF MEAN.
34.3448 = STANDARD DEVIATION.
4.8092 = STANDARD ERROR OF MEAN.
1051.0000 = SUM OF SCORES.
80637.0000 = SUM OF SQUARES.
13.5652 = SKEWNESS Z, (P = .0000).
36.3946 = KURTOSIS Z, (P = .0000).

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD	NORMAL
.2040	5	10	5	44	33
3.6046	5	10	15	45	40
7.0053	10	20	29	46	45
10.4059	10	20	49	47	50
13.8066	2	4	61	48	53
17.2072	3	6	66	49	54
20.6078	4	8	73	50	56
24.0085	1	2	77	51	58
27.4091	2	4	80	52	59
34.2104	2	4	84	54	60
37.6110	1	2	87	55	61
44.4123	1	2	89	57	62
51.2136	1	2	91	59	64
54.6142	1	2	93	60	65
61.4155	1	2	95	62	67
81.8193	1	2	97	68	69
190.6398	1	2	99	100	73

TABLE 22 (cont.)

VARIABLE 10

13.4706 = MEAN.
34.6638 = SIGMA.
4.8539 = SIGMA OF MEAN.
35.0088 = STANDARD DEVIATION.
4.9022 = STANDARD ERROR OF MEAN.
687.0000 = SUM OF SCORES.
70535.0000 = SUM OF SQUARES.
12.9796 = SKEWNESS Z, (P = .0000).
31.4023 = KURTOSIS Z, (P = .0000).

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD	NORMAL
-.3950	20	39	20	46	41
3.0714	12	24	51	47	50
6.5378	6	12	69	48	55
10.0042	2	4	76	49	57
13.4706	3	6	81	50	59
16.9370	1	2	85	51	60
23.8697	1	2	87	53	61
27.3361	1	2	89	54	62
34.2689	1	2	91	56	64
55.0672	1	2	93	62	65
68.9327	1	2	95	66	67
107.0630	1	2	97	77	69
186.7898	1	2	99	100	73

TABLE 22 (cont.)

VARIABLE 11

23.4118 = MEAN.
36.4052 = SIGMA.
5.0978 = SIGMA OF MEAN.
36.7675 = STANDARD DEVIATION.
5.1485 = STANDARD ERROR OF MEAN.
1194.0000 = SUM OF SCORES.
95546.0000 = SUM OF SQUARES.
10.2990 = SKEWNESS Z, (P = .0000).
21.0424 = KURTOSIS Z, (P = .0000).

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD	NORMAL
1.5686	10	20	10	44	37
5.2092	8	16	27	45	44
8.8497	8	16	43	46	48
12.4902	4	8	55	47	51
16.1307	2	4	61	48	53
19.7712	3	6	66	49	54
23.4118	2	4	71	50	55
27.0523	1	2	74	51	56
30.6928	2	4	76	52	57
34.3333	3	6	81	53	59
45.2549	3	6	87	56	61
52.5359	1	2	91	58	64
70.7386	1	2	93	63	65
85.3006	1	2	95	67	67
132.6274	1	2	97	80	69
205.4379	1	2	99	100	73

TABLE 22 (cont.)

VARIABLE 12

.6667 = MEAN.
1.4096 = SIGMA.
.1974 = SIGMA OF MEAN.
1.4236 = STANDARD DEVIATION
.1993 = STANDARD ERROR OF MEAN.
34.0000 = SUM OF SCORES.
124.0000 = SUM OF SQUARES.
9.3528 = SKEWNESS Z, (P = .0000).
18.0550 = KURTOSIS Z, (P = .0000).

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD	NORMAL
0.0000	36	71	35	45	46
1.0000	6	12	76	52	57
2.0000	5	10	87	59	61
3.0000	2	4	94	67	66
4.0000	1	2	97	74	69
8.0000	1	2	99	102	73

A P P E N D I X C

QUESTIONNAIRE FOR PANEL OF DECISION MAKERS

APPENDIX C

Questionnaire for Panel of Decision Makers
on
Post-Secondary Vocational/Technical Education Programs

The Texas State Plan for Vocational Education lists criteria for the evaluation of educational programs. Here is a list of these criteria adapted for use with certain tentative measures selected for them. These measures are to be given relative weights based on your judgments.

Assuming a program evaluation based entirely on these measures, please assign each measure a percentage weight corresponding to your judgment concerning its evaluation usefulness. The percentages assigned should equal 100% when totaled. A zero weight may be assigned if the measure is judged to be totally useless.

After each set of measures, one space has been left blank for your possible use; you may insert an additional measure (and your weight for it) if you wish - or leave the space blank.

Criteria	Measure	Assigned Percentage Weight
1. NEED for program in local area	a. Current employment in field, locally (from Annual Application for Funds)	_____%
	b. Projected demand in field, locally (from Annual Application for Funds)	_____%
	c. Projected supply in field, locally, from public education (from Annual Application for Funds)	_____%
	d. Projected supply in field, locally, from non-public education (from Annual Application for Funds)	_____%
	e. _____	_____%
2. RESPONSE of local area to the offering of the program	a. First-year-student enrollment for 1969-70 academic year (from Texas Guidance Information Program)	_____%

Criteria	Measure		Assigned Percentage Weight
	b.	Combination of first and second-year-student enrollment during academic year of 1970-71 (from USOE enrollment report)	_____%
	c.	_____	_____%
3. COSTS of program	a	Program's contact-hour dollars earned for 1970-71 (from Student Contact Hours Taught in Texas Public Junior Colleges, April,1971)	_____%
	b.	Estimated local funds for program's budget for 1970-71 (from Annual Application for Funds)	_____%
	c	_____	_____%
4. RESULTS of the operation of the program	a	Program completions for FY 1971 (from USOE "Placement of Program Completions in Vocational Education Programs")	_____%
	b.	Students leaving prior to completion with marketable skill (from "Placement of Program Completions in Vocational Education Programs" FY 1971)	_____%
	c.	Students known to be employed full time in field trained or related field (from USOE "Placement of Program Completions in Vocational Education Programs" FY 1971)	_____%
	d.	Students known to be unemployed (from "Placement of Program Completions in Vocational Education Programs" FY 1971)	_____%
	e.	_____	_____%
5. DOCUMENTATION of program	a.	Submission of Annual Application	_____%
	b.	Submission of USOE Enrollment Report	_____%
	c.	Submission of USOE Follow-Up Report	_____%
	d.	Participation in Texas Guidance Information Program	_____%
	e.	_____	_____%
			Total = 100%

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